Contents

Contents

FieldQ "fully integrated" actuator and control modules

General Overview

Description

The FieldQ package consists of an actuator with one or two modules, which form an integrated concept for “On/Off” valve automation. These components are:

1 Basic actuators

The basic actuator supplies the torque, required to open and close valves and is available in various sizes (rated 47 to 1676Nm at 5.5barg or 413 to 14874 In.lb. at 80pisg). Double acting and spring return executions are available. The spring return execution can be equipped with multiple spring sets to cover a pressure range from 2 to 8 barg (30 to 120 psig).

2 Pneumatic Modules

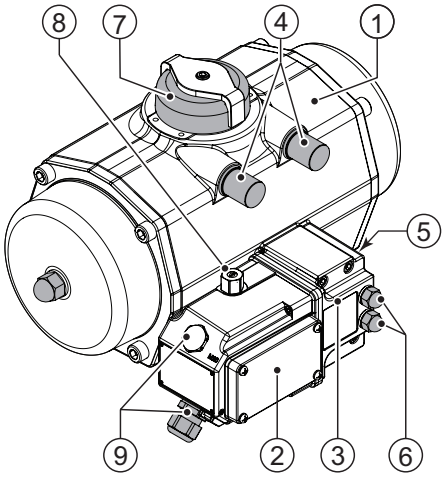
The Pneumatic Module is the pneumatic interface between the basic actuator and the Control Module. It contains a booster block which is controlled by a pilot valve in the Control Module. Optionally, the Pneumatic Module can be equipped with integrated Speed Control throttles.
Note: “Smart”, “Integrated Base” and” Bus communication” Control Modules require a separate pneumatic module.

3 Control Modules

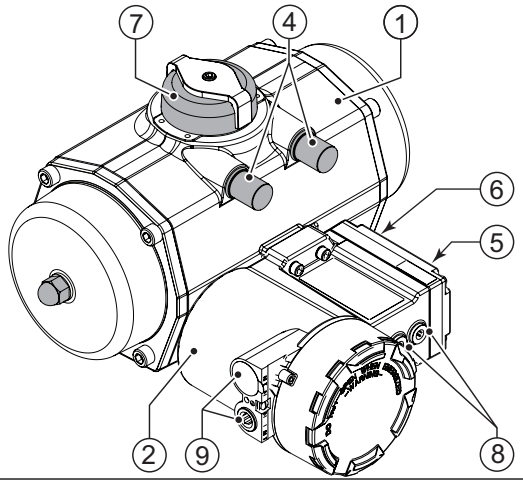
The Control Modules contain the terminal connections for control and feedback signals, the pilot valve for directly controlling the Pneumatic Module and indirectly controlling the basic actuator. Three ranges of control modules are available:

1. **“Smart” Control Modules:** These processor based modules have additional electronics and a button board. This button board enables start of the auto-initialization procedure, which automatically sets the feedback switch points for the actuator's position limits.
   Included in this range of “Smart” Control Modules are the modules with bus communication protocols like **Foundation Fieldbus™, DeviceNet and ASI.**
2. **The “Integrated Base” Control Modules** are conventionally wired control modules which include a pilot valve and switches for control and position feedback.
3. **The “XP” control modules** are the newest range with further integration to comply with the Explosion proof (XP) or Flame proof (Ex d) protection methods as required by FM, CSA, ATEX or IECEx. These XP Control Modules are conventionally wired control modules which include **easily exchangeable switch and pilot valve cartridges**, all integrated into one single housing. A new optional feature of the XP control modules is the **Fail In Last Position control function** for double acting actuators.

FieldQ valve actuator with “Smart” or "Integrated Base" Control Modules



FieldQ valve actuator with single piece Explosion Proof Control Module



1 Basic Actuator
2 Control Module
3 Pneumatic Module
4 Limit stop screws for “Open” and “Closed” position
5 G1/4” or 1/4”NPT air connections
6 Optional: Built-in speed control
7 Visual position indication
8 Optional: Manual Control
9 Electrical entries

Actuator specifications:

Construction

- Ingress protection rated IP65 / NEMA4X and suitable for indoor and outdoor installation.

Finish

- Housing: Anodized with a polyester non-TGIC based powder coating
- Pistons: Chromate treatment.
- Pinion: Hard anodized

Lubrication

- Factory lubricated for the normal life of the actuator.

Temperature

- Depends on the Control Module used. See applicable data sheets 1.604.xxx.

European Directives

- The basic actuator complies to PED 97/23/EC, Machinery Directive 2006/42/EC and to ATEX 94/9/EC and is marked: Ⓔx II 2 GD c IIC TX

Pressure

- Double acting: 2 to 8 bar / 30 to 120 psi
- Spring return
  - with maximum spring set: 6 to 8 bar / 87 to 120 psi
  - with reduced spring set: 3 to 8 bar / 43 to 120 psi

Operating media

- Dry air or inert gasses, filtered to 50 microns.
- The following Control Modules require air filtered to 5 microns: QC03, QC04 and QC34 (see applicable data sheets 1.604.xx).
- Dew point 10K below operating temperature. For subzero applications take appropriate measures to protect the installation.

Torque

- 40 to 1600 Nm. (300 to 11000 lbf.in) See sheets 1.602.01, 1.602.02 or 1.602.03.

Rotation

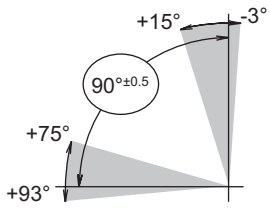
- Factory set at 90°±0.5°. Adjustable range: -3° to +15° and +75° to 93°
- Clockwise fail-to-close action, see sheet 1.606.04 for optional fail-to-open action (assembly codes).
- See 1.606.03 for other double acting assembly codes.
- For more info on failure modes see 1.606.02

Cycle life

- 500.000 cycles minimum

NAMUR plate

The top flange of the FieldQ actuator is equipped with a NAMUR (VDE/VDI 3845) drilling pattern.
The addition of a NAMUR plate makes the FieldQ actuator suitable for mounting all kinds of NAMUR compatible control accessories like solenoids. For more info on NAMUR plate, see sheet 1.605.03.

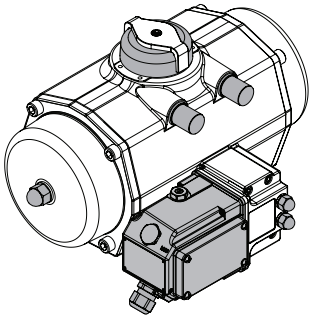


FieldQ Valve Actuator:
Rotation and adjustable range

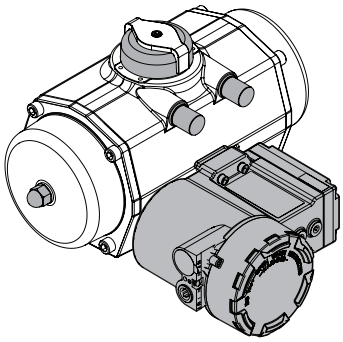
Actuator data			Q40	Q65	Q100	Q150	Q200	Q350	Q600	Q950	Q1600
Bore		mm.	70	80	91	103	110	145	175	200	230
		inch	2,76	3,15	3,58	4,06	4,33	5,71	6,89	7,87	9,06
Stroke		mm.	18,8	22,0	25,1	31,4	37,7	37,7	44,0	50,3	62,8
		inch	0,74	0,87	0,99	1,24	1,48	1,48	1,73	1,98	2,47
Weight:	Double acting	kg.	1,8	2,4	3,1	4,5	5,8	10,4	19	26	43
		lb.	4,0	5,3	6,8	9,8	13	23	43	58	94
	Spring return	kg.	2,4	3,6	4,6	6,9	9,1	17	28	39	66
		lb.	5,3	7,9	10	15,1	20	37	61	85	145
Operating time		sec.	0,7	1,1	1,2	1,8	2,3	3,6	4,5	5,4	6,9
Air consumption per stroke											
at 1 atm (litres)	Central air chamber		0,16	0,33	0,35	0,84	0,8	1,8	2,9	4,7	7,3
	Endcap air chambers		0,22	0,36	0,49	0,78	1	1,9	3,1	4,9	8,0
at 1 atm (cu. in.)	Central air chamber		10	20	21	51	49	110	177	287	445
	Endcap air chambers		13	22	30	48	61	116	189	299	488

Control Modules

Smart and Intergrated Base Modules



Explosion Proof (XP) Modules



The following version of Control modules are available:

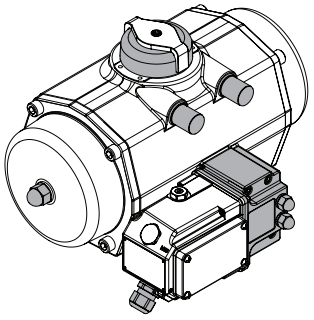
Smart modules	**Sheet nr.**
- QC01 24VDC,	1.604.01
- QC02 85-254VAC	1.604.01
- QC03 Intrinsically safe	1.604.011
- QC04 Intrinsically safe with NAMUR feedback	1.604.011
Bus communication modules	
- QC30 AS-Interface	1.604.04
- QC31 DeviceNet	1.604.09
- QC34 Foundation™ Fieldbus	1.604.02
Integrated Base modules	
- QC11 24VDC	1.604.06
- QC12 115VAC	1.604.06
- QC13 230VAC	1.604.06
- QC14 Intrinsically safe	1.604.07
Explosion proof (XP) Control modules	
- QC41 24VDC	1.604.10
- QC42 115VAC	1.604.10
- QC43 230VAC	1.604.10

Options

Manual Control, IECEx, ATEX, FM or CSA approvals, glands, plugs and connector plugs.

Pneumatic Modules

Pneumatic Modules



- "Smart", "Integrated Base" and" Bus communication" Control Modules require a separate pneumatic module.
- "Explosion proof" Control Modules have a build-in pneumatic booster block and do not require a separate pneumatic module.

Functions :

Double or Single Acting (spring return)
Fail-in-Last position (Only on XP control modules)

Actuator range :

Suitable for Q40 to Q1600 (see note below).

Enclosure :

IP65 / NEMA4X

Pneumatic connections:

G1/4" or 1/4"NPT

"Breather" function:

Standard for single acting actuators

Options :

Speed control, exhaust port filters or silencers.

Technical specifications

See sheets 1.605.xx

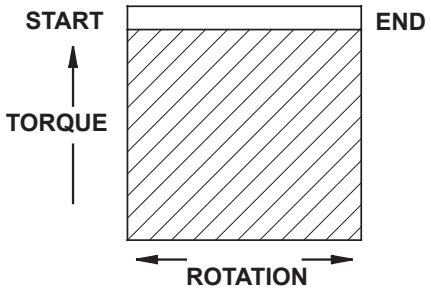
FieldQ Actuator Torque

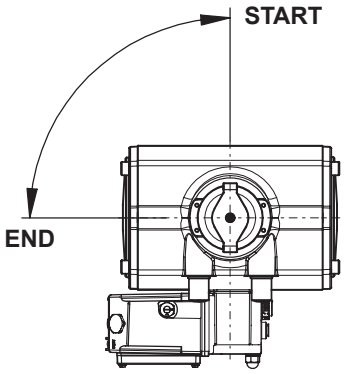
Double Acting Actuators - Nm & lbf.in

Actuator type	Torque (Nm)										
	Supply Pressure (bar g)										
	2	3	3.5	4	4.5	5	5.5	6	6.5	7	8
QD 40	17	25	29	34	38	42	47	51	55	59	68
QD 65	25	38	45	51	58	64	71	77	84	90	104
QD 100	38	57	66	76	86	95	105	115	124	134	153
QD 150	60	91	106	122	137	153	168	183	199	214	245
QD 200	82	124	146	167	188	209	230	251	272	293	335
QD 350	143	216	253	290	326	363	400	436	473	510	583
QD 600	243	368	430	492	554	617	679	741	804	866	991
QD 950	363	549	642	735	828	921	1014	1107	1200	1293	1479
QD 1600	600	907	1061	1214	1368	1522	1676	1829	1983	2137	2444

Actuator type	Torque (lbf.in)										
	Supply pressure (psig)										
	30	45	50	60	65	70	75	80	90	100	120
QD 40	153	231	257	309	335	361	387	413	465	518	622
QD 65	233	352	391	471	511	550	590	630	709	789	948
QD 100	344	520	579	696	755	814	873	931	1049	1166	1401
QD 150	551	833	927	1115	1209	1303	1397	1491	1680	1868	2244
QD 200	754	1140	1269	1526	1655	1784	1913	2041	2299	2556	3071
QD 350	1310	1981	2205	2652	2876	3100	3323	3547	3994	4442	5337
QD 600	2226	3366	3747	4507	4887	5267	5647	6028	6788	7548	9069
QD 950	3323	5025	5593	6727	7295	7862	8430	8997	10132	11267	13537
QD 1600	5493	8307	9245	11121	12059	12998	13936	14874	16750	18626	22379

Double acting torque diagram





Note:

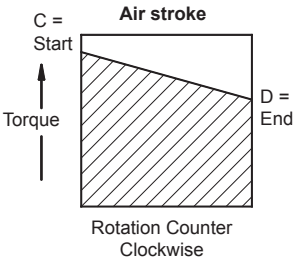
1. Emerson Process Management recommends that the valve manufacturer supply the maximum required torque values (Including any adjustments or suggested safety factors for valve service conditions or application). Additionally, the valve manufacturer must identify at which position(s) and direction(s) of rotation (Counter Clock Wise or Clock Wise) these maximum requirements occur.
2. If in doubt, or you require any assistance with sizing actuators, do not hesitate to contact your nearest Emerson's Valve Automation representative.

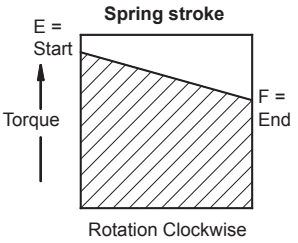
FieldQ Actuator Torque

Spring Return Actuators - Nm

Spring set nr.		Air Torque (Nm) Supply pressure (bar g)																Spring Torque (Nm)	
Actuator Size		3		3.5		4		4.5		5		5.5		6		7			
		C	D	C	D	C	D	C	D	C	D	C	D	C	D	C	D	E	F
QS 40	2	17	11	22	16	26	21	31	25	35	30	40	34	44	39	53	48	13	8
	3	12	4	17	8	21	13	26	17	31	22	35	27	40	31	49	40	20	12
	4	-	-	12	1	17	5	21	10	26	14	30	19	35	23	44	32	26	17
	5	-	-	-	-	-	-	17	2	21	7	26	11	30	16	39	25	33	21
	6	-	-	-	-	-	-	-	-	-	-	21	4	25	8	34	17	40	25
QS65	2	26	17	32	23	39	30	46	37	53	44	60	51	67	58	81	72	21	13
	3	18	4	25	11	32	18	39	25	45	32	52	39	59	46	73	60	32	20
	4	-	-	-	-	24	6	31	13	38	20	45	27	52	34	65	48	42	26
	5	-	-	-	-	-	-	23	1	30	8	37	15	44	22	58	35	53	33
	6	-	-	-	-	-	-	-	-	-	-	30	3	36	10	50	23	63	40
QS 100	2	39	27	49	37	60	47	70	57	80	67	90	78	100	88	121	108	29	18
	3	29	10	39	20	49	30	59	40	70	51	80	61	90	71	110	91	44	27
	4	-	-	28	3	39	13	49	24	59	34	69	44	79	54	100	75	58	36
	5	-	-	-	-	-	-	38	7	49	17	59	27	69	38	89	58	73	46
	6	-	-	-	-	-	-	-	-	38	0	48	11	59	21	79	41	88	55
QS 150	2	63	41	79	58	95	74	112	90	128	107	144	123	161	139	193	172	48	29
	3	46	14	62	30	79	47	95	63	111	79	128	96	144	112	177	145	72	44
	4	-	-	-	-	62	19	78	36	94	52	111	68	127	85	160	117	95	58
	5	-	-	-	-	-	-	-	-	78	24	94	41	110	57	143	90	119	73
	6	-	-	-	-	-	-	-	-	-	-	-	-	94	30	126	62	143	88
QS 200	2	85	57	107	79	130	101	152	124	174	146	197	168	219	191	264	236	65	41
	3	61	19	84	41	106	64	129	86	151	109	173	131	196	153	240	198	98	61
	4	-	-	60	4	83	26	105	49	127	71	150	93	172	116	217	160	131	82
	5	-	-	-	-	-	-	82	11	104	33	126	56	149	78	193	123	163	102
	6	-	-	-	-	-	-	-	-	-	-	103	18	125	41	170	85	196	123
QS 350	2	144	96	183	135	221	174	260	213	299	251	338	290	377	329	454	407	116	74
	3	101	30	140	68	179	107	217	146	256	185	295	224	334	263	412	340	174	112
	4	-	-	97	2	136	41	175	80	214	118	252	157	291	196	369	274	232	149
	5	-	-	-	-	-	-	132	13	171	52	210	91	248	130	326	207	289	186
	6	-	-	-	-	-	-	-	-	-	-	167	24	206	63	283	141	347	223
QS 600	2	249	166	315	232	381	298	447	364	513	430	579	496	645	562	777	694	195	122
	3	179	54	245	120	311	186	377	252	443	318	509	384	575	450	707	582	292	183
	4	-	-	174	8	240	74	306	140	372	206	438	272	504	338	636	470	389	245
	5	-	-	-	-	-	-	236	28	302	94	368	160	434	226	566	358	487	306
	6	-	-	-	-	-	-	-	-	-	-	298	48	364	114	496	246	584	367
QS 950	2	375	248	474	347	572	446	671	544	769	643	868	741	966	840	1163	1037	290	179
	3	272	82	371	181	469	279	568	378	666	476	765	575	863	673	1060	870	434	269
	4	-	-	268	14	366	113	465	211	563	310	662	408	760	507	957	704	579	359
	5	-	-	-	-	-	-	362	45	460	143	559	242	657	340	854	537	724	448
	6	-	-	-	-	-	-	-	-	-	-	455	75	554	174	751	371	869	538
QS 1600	2	617	416	780	579	943	742	1106	905	1269	1068	1432	1231	1594	1394	1920	1719	474	299
	3	445	144	608	307	771	470	934	633	1097	796	1260	959	1423	1121	1748	1447	711	449
	4	-	-	436	35	599	198	762	361	925	523	1088	686	1251	849	1576	1175	947	598
	5	-	-	-	-	-	-	590	88	753	251	916	414	1079	577	1405	903	1184	748
	6	-	-	-	-	-	-	-	-	-	-	744	142	907	305	1233	630	1421	897

Spring return torque diagrams





Note:

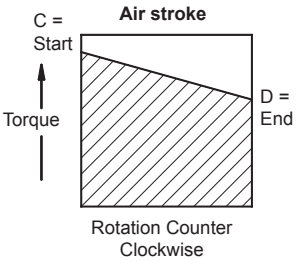
1. Emerson Process Management recommends that the valve manufacturer supply the maximum required torque values (Including any adjustments or suggested safety factors for valve service conditions or application).
   Additionally, the valve manufacturer must identify at which position(s) and direction(s) of rotation (Counter Clock Wise or Clock Wise) these maximum requirements occur.
2. If in doubt, or you require any assistance with sizing actuators, do not hesitate to contact your nearest Emerson's Valve Automation representative.

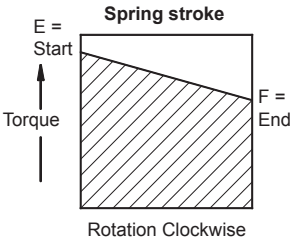
FieldQ Actuator Torque

Spring Return Actuators - lbf.in

Spring set nr.		Air Torque (lbf.in) Supply pressure (psig)												Spring Torque (lbf.in)	
Actuator Size		40		60		80		90		100		120			
		C	D	C	D	C	D	C	D	C	D	C	D	E	F
QS 40	2	133	82	243	193	354	303	409	358	464	414	575	524	117	73
	3	-	-	201	125	312	236	367	291	422	346	533	457	176	110
	4	-	-	159	58	270	169	325	224	380	279	491	390	234	146
	5	-	-	-	-	227	101	283	156	338	212	448	322	293	183
	6	-	-	-	-	-	-	241	89	296	144	406	255	351	220
QS 65	2	196	117	364	285	533	454	617	538	701	622	870	790	186	117
	3	-	-	297	178	466	347	550	431	634	515	802	683	279	176
	4	-	-	230	71	398	240	482	324	567	408	735	576	372	234
	5	-	-	-	-	331	133	415	217	499	301	668	470	465	292
	6	-	-	-	-	-	-	348	110	432	194	601	363	558	351
QS 100	2	303	192	552	441	801	690	926	814	1050	939	1299	1188	258	161
	3	211	44	460	293	709	541	833	666	957	790	1206	1039	387	242
	4	-	-	367	144	616	393	740	518	865	642	1114	891	516	323
	5	-	-	-	-	523	245	648	369	772	494	1021	743	646	403
	6	-	-	-	-	430	96	555	221	679	345	928	594	775	484
QS 150	2	485	297	884	696	1283	1094	1482	1294	1681	1493	2080	1892	423	259
	3	-	-	735	453	1134	852	1333	1051	1533	1250	1931	1649	634	388
	4	-	-	587	210	985	609	1185	808	1384	1007	1783	1406	845	517
	5	-	-	-	-	837	366	1036	565	1235	764	1634	1163	1056	647
	6	-	-	-	-	-	-	887	322	1087	522	1485	920	1268	776
QS 200	2	656	406	1201	952	1747	1497	2020	1770	2293	2043	2838	2589	579	362
	3	-	-	994	619	1539	1165	1812	1438	2085	1710	2631	2256	868	542
	4	-	-	786	287	1332	832	1604	1105	1877	1378	2423	1923	1158	723
	5	-	-	-	-	1124	500	1396	772	1669	1045	2215	1591	1447	904
	6	-	-	-	-	-	-	1189	440	1462	713	2007	1258	1736	1085
QS 350	2	1105	684	2053	1632	3001	2580	3475	3054	3949	3528	4897	4476	1025	658
	3	-	-	1675	1043	2623	1991	3097	2465	3571	2939	4519	3887	1537	987
	4	-	-	1297	454	2245	1402	2719	1877	3193	2351	4141	3299	2049	1317
	5	-	-	-	-	1866	814	2340	1288	2814	1762	3762	2710	2561	1646
	6	-	-	-	-	-	-	1962	699	2436	1173	3384	2121	3074	1975
QS 600	2	1920	1183	3531	2794	5142	4405	5947	5211	6753	6016	8364	7628	1723	1082
	3	-	-	2909	1804	4520	3415	5325	4221	6131	5026	7742	6637	2585	1624
	4	-	-	2287	814	3898	2425	4703	3230	5509	4036	7120	5647	3446	2165
	5	-	-	-	-	3276	1434	4081	2240	4887	3046	6498	4657	4308	2706
	6	-	-	-	-	-	-	3459	1250	4265	2055	5876	3666	5169	3247
QS 950	2	2898	1777	5303	4182	7708	6587	8910	7789	10113	8992	12518	11396	2563	1587
	3	-	-	4391	2709	6796	5114	7998	6316	9201	7519	11606	9924	3844	2381
	4	-	-	3479	1236	5883	3641	7086	4844	8288	6046	10693	8451	5125	3175
	5	-	-	-	-	4971	2168	6174	3371	7376	4573	9781	6978	6407	3968
	6	-	-	-	-	-	-	5262	1898	6464	3100	8869	5505	7688	4762
QS 1600	2	4765	2988	8741	6964	12716	10939	14704	12927	16692	14915	20668	18890	4193	2646
	3	-	-	7220	4554	11195	8530	13183	10517	15171	12505	19147	16481	6289	3970
	4	-	-	5699	2144	9675	6120	11662	8108	13650	10096	17626	14071	8385	5293
	5	-	-	-	-	8154	3711	10141	5698	12129	7686	16105	11662	10481	6616
	6	-	-	-	-	-	-	8621	3289	10608	5277	14584	9252	12578	7939

Spring return torque diagrams



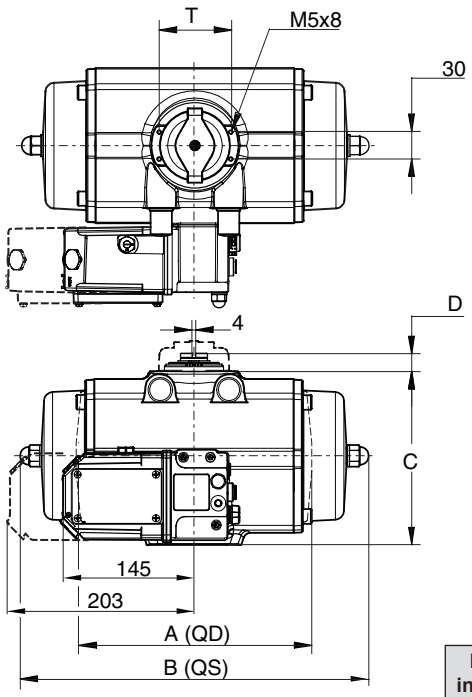


Note:

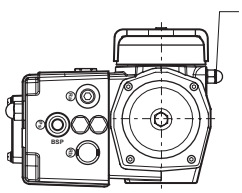
1. Emerson Process Management recommends that the valve manufacturer supply the maximum required torque values (Including any adjustments or suggested safety factors for valve service conditions or application).
   Additionally, the valve manufacturer must identify at which position(s) and direction(s) of rotation (Counter Clock Wise or Clock Wise) these maximum requirements occur.
2. If in doubt, or you require any assistance with sizing actuators, do not hesitate to contact your nearest Emerson's Valve Automation representative.

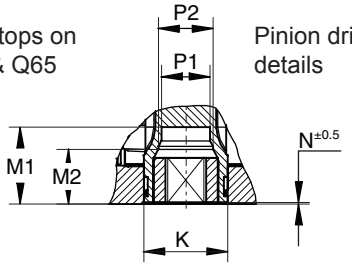
FieldQ Valve Actuator Dimensions

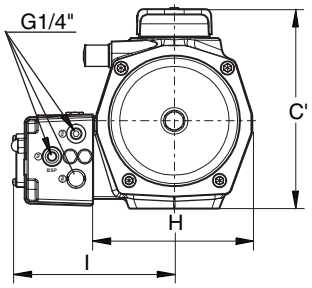
Metric Actuators - ISO5211



145 = Integrated Smart Module
203 = Integrated Base Module

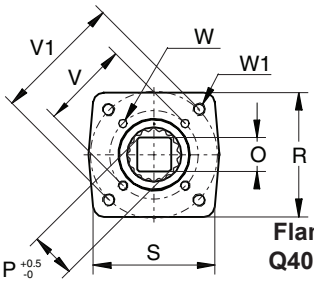




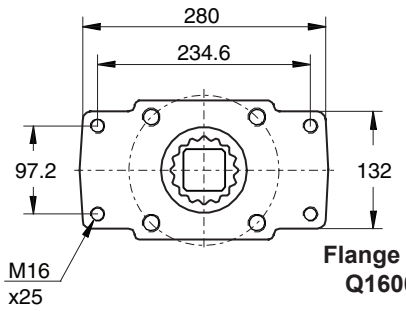


Note:

1. Dimensions are metric (mm).
2. The limit stop screws on the Q40 and Q65 are on the opposite side to those on the larger actuators.
3. Top flange according VDI/VDE 3845 (NAMUR)



Flange for Q40 - Q950



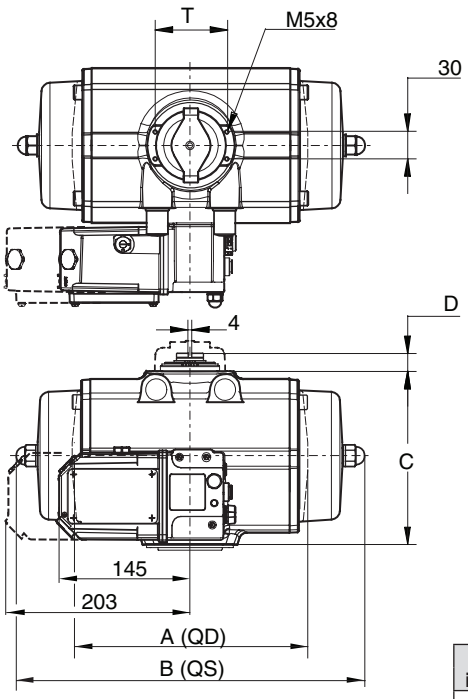
Flange for Q1600

*) Four holes of the F25 ISO Drilling pattern

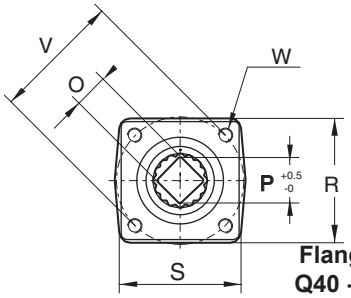
Dim in mm.	FieldQ™ actuator models								
	Q40	**Q65**	**Q100**	**Q150**	**Q200**	**Q 350**	**Q600**	**Q950**	**Q1600**
A QD	145	168	181	217	242	262	327	366	447
B QS	202	249	254	311	358	391	419	460	568
C	104	117	141	150	161	191	245	276	337
C'	137	150	175	184	194	225	289	319	380
D	20	20	20	20	20	20	30	30	30
E	56	56	56	65	66	66	84	88	95
F	16	18	18	22	30	30	35	35	45
G	9,5	9	11	10	9	10	19,5	19	28,5
H	90	102	115	129	135	177	209	234	268
I	75	81	88	97	99	119	134	147	164
J	40	40	34	46	45	46	53	40	70
K	33	33	38	55	55	55	68	75	95
M1	34.5	34.5	34.5	50	50	50	52	64	82
M2	-	-	27	-	37	37	-	-	-
N	1	1	1.5	1.0	1.5	1.5	1.5	1.5	1.5
O max.	14.11	14.11	19.13	19.13	22.13	27.13	27.13	36.16	46.16
O min.	14.00	14.00	19.00	19.00	22.00	27.00	27.00	36.00	46.00
P	18.1	18.1	25.2	25.2	28.2	36.2	36.2	48.2	60.2
P1	18.1	18.1	23.1	28.5	32.1	32.1	36.5	48.5	60.5
P2	-	-	25.2	-	36.2	36.2	-	-	-
R	65	70	70	90	90	114	124	130	154
S	65	70	70	90	90	114	124	142	280
T	80	80	80	80	80	80	130	130	130
PCD	**F05/F07**	**F05/F07**	**F05/F07**	**F07/F10**	**F07/F10**	**F07/F10**	**F10/F12**	**F10/F14**	**F16/F25***
V	50	50	50	70	70	70	102	102	165
V1	70	70	70	102	102	102	125	140	-
W	M6x10	M6x10	M6x10	M8x13	M8x13	M8x13	M10x16	M10x16	M20x30
W1	M8x13	M8x13	M8x13	M10x16	M10x16	M10x16	M12x20	M16x25	-

FieldQ Valve Actuator Dimensions

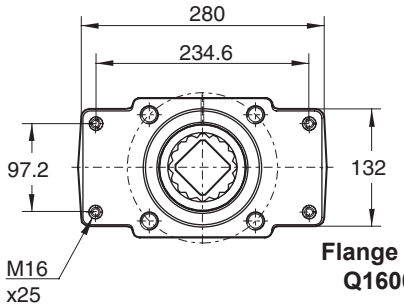
Metric Actuators - DIN3337



145 = Integrated Smart Module
203 = Integrated Base Module

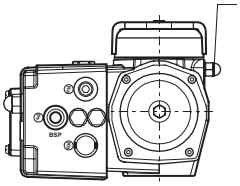


Flange for Q40 - Q950

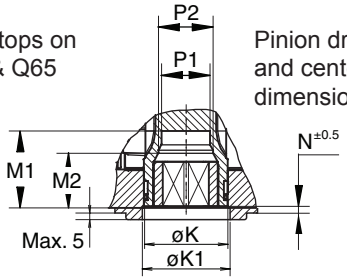


Flange for Q1600

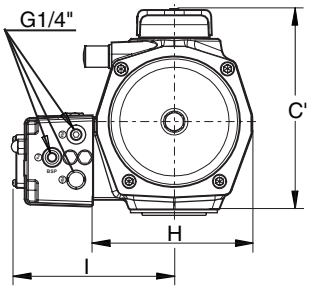
*) Four holes of the F25 Drilling pattern



limit stops on Q40 & Q65



Pinion drive details and center plate dimensions



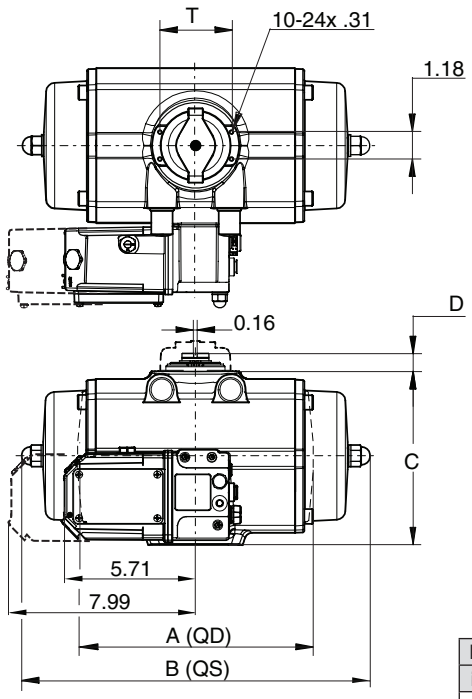
Note:

1. Dimensions are metric (mm).
2. The limit stop screws on the Q40 and Q65 are on the opposite side to those on the larger actuators.
3. Top flange according VDI/VDE 3845 (NAMUR)

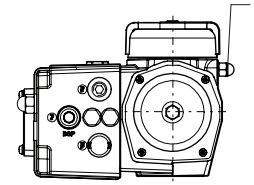
Dim	FieldQ™ actuator models								
in mm.	Q40	Q65	Q100	Q150	Q200	Q350	Q600	Q950	Q1600
A QD	145	168	181	217	242	262	327	366	447
B QS	202	249	254	311	358	391	419	460	568
C	104	116,5	141	150	161	191	245	276	337
C'	137	150,4	175	184	194	225	289	319	380
D	20	20	20	20	20	20	30	30	30
E	56	56	56	65	66	66	84	88	95
F	16	18	18	22	30	30	35	35	45
G	9,5	14	11	10	9	10	19,5	19	28,5
H	86	102	108	129	128	173	207	231	265
I	128	141,8	141	97	149	171	187	200	217
J	40	40	34	46	45	46	53	40	70
K	33	33	38	55	55	55	68	75	95
K1	32	32	40	50	54	54	68	75	95
M1	34.5	34.5	34.5	50	50	50	52	64	82
M2	-	-	27	-	37	37	-	-	-
N	1	1	1.5	1	1.5	1.5	1.5	1.5	1.5
O max.	14.11	14.11	17.13	17.13	22.13	22.13	27.13	36.16	46.16
O min.	14.00	14.00	17.00	17.00	22.00	22.00	27.00	36.00	46.00
P	18.1	18.1	22.2	22.2	28.2	28.2	36.2	48.2	60.2
P1	18.1	18.1	23.1	28.5	32.1	32.1	36.5	48.5	60.5
P2	-	-	25,2	-	36,2	36,2	-	-	-
Q	35	70	55	55	70	70	85	100	130
R	65	70	70	90	90	114	124	130	154
S	65	80	70	90	90	114	124	142	280
T	80	50	80	80	80	80	130	130	130
PCD	F05	F05	F07	F07	F10	F10	F12	F14	F16
V	50	50	70	70	102	102	125	140	165
W	M6x10	M6x10	M8x13	M8x13	M10x16	M10x16	M12x20	M16x25	M20x30
Optional dimensions									
K1'	40	40	32	54	50	50	-	-	-
Q'	55	35	35	70	55	55	-	-	-
PCD	F07	F07	F05	F10	F07	F07	F10	F10	F25*
V'	70	70	50	102	70	70	102	102	-
W'	M8x13	M8x13	M6x10	M10x16	M8x13	M8x13	M10x16	M10x16	-

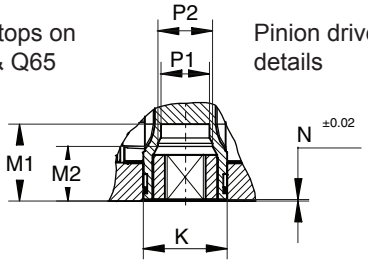
FieldQ Valve Actuator Dimensions

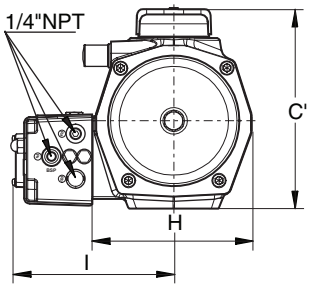
Imperial Actuators - ISO5211



5.71 = Integrated Smart Module
7.99 = Integrated Base Module

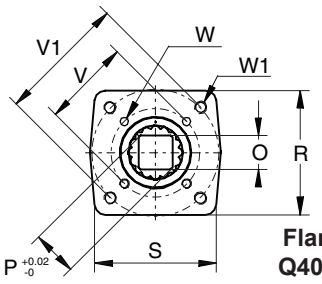




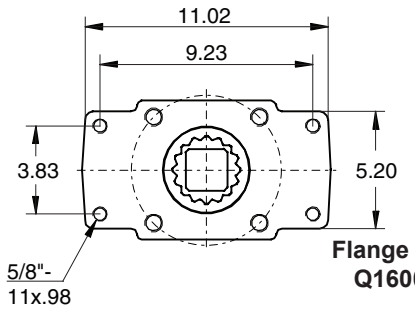


Note:

1. Dimensions are in inches.
2. The limit stop screws on the Q40 and Q65 are on the opposite side to those on the larger actuators.
3. Top flange according VDI/VDE 3845 (NAMUR)



Flange for Q40 - Q950



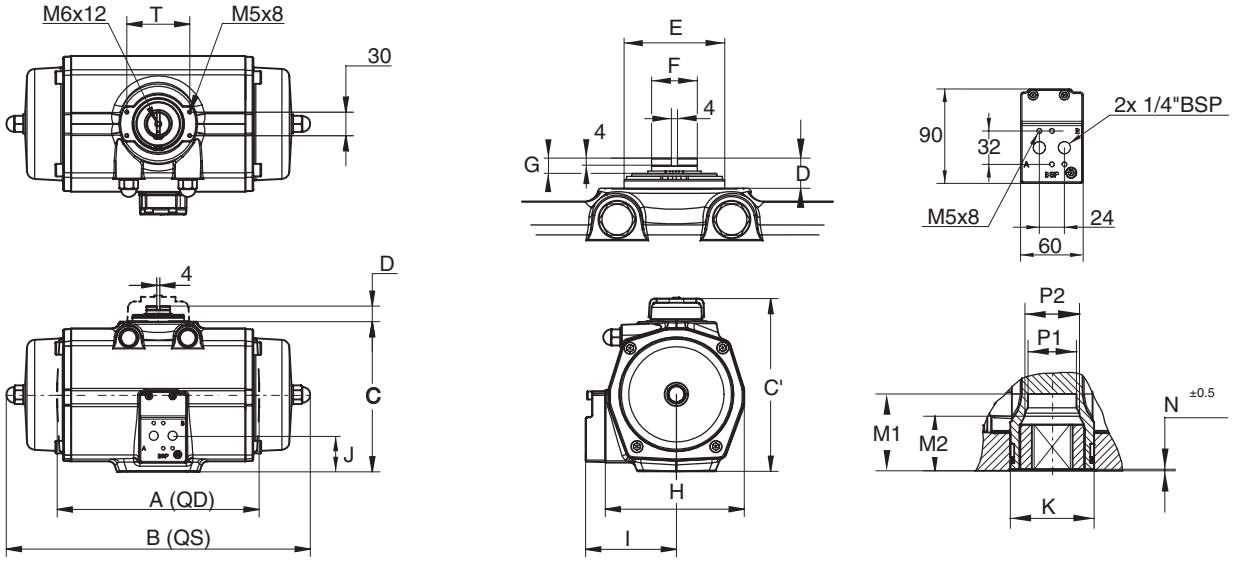
Flange for Q1600

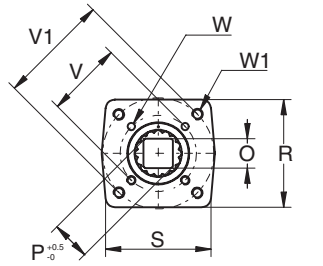
*) Four holes of the F25 ISO Drilling pattern

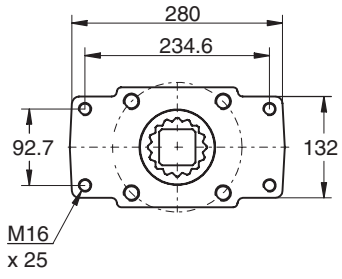
Dim. in	FieldQ™ actuator models								
inches	Q40	Q65	Q100	Q150	Q200	Q 350	Q600	Q950	Q1600
A QD	5.71	6.61	7.13	8.54	9.54	10.31	12.87	14.40	17.58
B QS	7.94	9.79	9.99	12.24	14.09	15.38	16.50	18.09	22.34
C	4.09	4.59	5.55	5.91	6.34	7.52	9.65	10.87	13.27
C'	5.39	5.92	6.89	7.24	7.64	8.86	11.38	12.56	14.96
D	0.79	0.79	0.79	0.79	0.79	0.79	1.18	1.18	1.18
E	2.20	2.20	2.20	2.56	2.60	2.60	3.31	3.46	3.74
F	0.63	0.71	0.71	0.87	1.18	1.18	1.38	1.38	1.77
G	0.37	0.35	0.43	0.39	0.35	0.39	0.77	0.75	1.12
H	3.54	4.02	4.53	5.08	5.31	6.97	8.23	9.21	10.55
I	2.95	3.19	3.46	3.82	3.90	4.69	5.28	5.79	6.46
J	1.56	1.56	1.32	1.81	1.78	1.81	2.08	1.58	2.75
K	1.30	1.30	1.50	2.17	2.17	2.17	2.68	2.95	3.74
M1	1.36	1.36	1.36	1.97	1.97	1.97	2.05	2.52	3.23
M2	-	-	1.06	-	1.46	1.46	-	-	-
N	0.04	0.04	0.06	0.04	0.06	0.06	0.06	0.06	0.06
O max.	0.556	0.556	0.753	0.753	0.871	1.068	1.068	1.424	1.817
O min.	0.551	0.551	0.748	0.748	0.866	1.063	1.063	1.417	1.811
P	0.71	0.71	0.99	0.99	1.11	1.43	1.43	1.90	2.37
P1	0.71	0.71	0.91	1.12	1.26	1.26	1.44	1.91	2.38
P2	-	-	0.99	-	1.43	1.43	-	-	-
R	2.56	2.76	2.76	3.54	3.54	4.49	4.88	5.12	6.06
S	2.56	2.76	2.76	3.54	3.54	4.49	4.88	5.59	11.02
T	3.15	3.15	3.15	3.15	3.15	3.15	5.12	5.12	5.12
PCD	F05/F07	F05/F07	F05/F07	F07/F10	F07/F10	F07/F10	F10/F12	F10/F14	F16/F25*
V	1.969	1.969	1.969	2.756	2.756	2.756	4.016	4.016	6.496
V1	2.756	2.756	2.756	4.016	4.016	4.016	4.921	5.512	-
W	1/4"-20x.39	1/4"-20x.39	1/4"-20x.39	5/16"-18x.39	5/16"-18x.39	5/16"-18x.39	3/8"-16x.63	3/8"-16x.63	3/4"-10x1.14
W1	5/16"-18x.39	5/16"-18x.39	5/16"-18x.39	3/8"-16x.63	3/8"-16x.63	3/8"-16x.63	1/2"-13x.79	5/8"-11x.98	-

FieldQ Valve Actuator Dimensions

Metric Actuators - ISO5211 / NAMUR plate







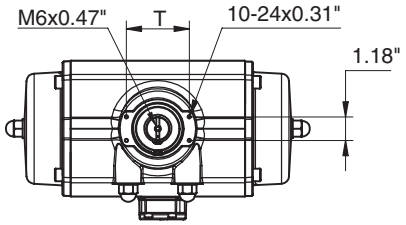
Dim	FieldQ™ actuator models								
in mm.	Q40	Q65	Q100	Q150	Q200	Q 350	Q600	Q950	Q1600
A QD	145	168	181	217	242	262	327	366	447
B QS	202	249	254	311	358	391	419	460	568
C	104	117	141	150	161	191	245	276	337
C'	137	150	175	184	194	225	289	319	380
D	20	20	20	20	20	20	30	30	30
E	56	56	56	65	66	66	84	88	95
F	16	18	18	22	30	30	35	35	45
G	9,5	9	11	10	9	10	19,5	19	28,5
H	90	102	115	129	135	177	209	234	268
I	75	81	88	97	99	119	134	147	164
J	40	40	34	46	45	46	53	40	70
K	33	33	38	55	55	55	68	75	95
M1	34.5	34.5	34.5	50	50	50	52	64	82
M2	-	-	27	-	37	37	-	-	-
N	1	1	1.5	1.0	1.5	1.5	1.5	1.5	1.5
O max.	14.11	14.11	19.13	19.13	22.13	27.13	27.13	36.16	46.16
O min.	14.00	14.00	19.00	19.00	22.00	27.00	27.00	36.00	46.00
P	18.1	18.1	25.2	25.2	28.2	36.2	36.2	48.2	60.2
P1	18.1	18.1	23.1	28.5	32.1	32.1	36.5	48.5	60.5
P2	-	-	25.2	-	36.2	36.2	-	-	-
R	65	70	70	90	90	114	124	130	154
S	65	70	70	90	90	114	124	142	280
T	80	80	80	80	80	80	130	130	130
PCD	F05/F07	F05/F07	F05/F07	F07/F10	F07/F10	F07/F10	F10/F12	F10/F14	F16/F25*
V	50	50	50	70	70	70	102	102	165
V1	70	70	70	102	102	102	125	140	-
W	M6x 10	M6x 10	M6x 10	M8x 13	M8x 13	M8x 13	M10x 16	M10x 16	M20x 30
W1	M8x 13	M8x 13	M8x 13	M10x 16	M10x 16	M10x 16	M12x 20	M16x 25	-

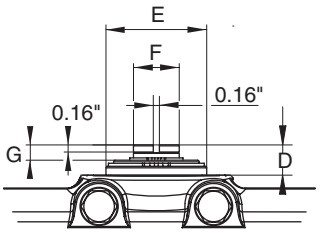
Note:

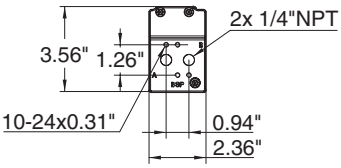
1. Dimensions are in mm.
2. The limit stop screws on the Q40 and Q65 are on the opposite side to those on the larger actuators.

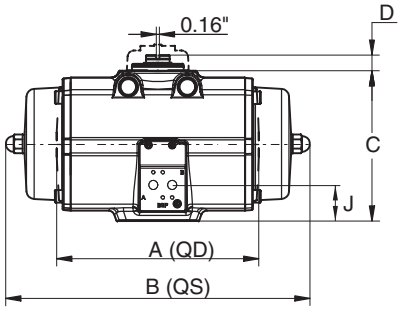
FieldQ Valve Actuator Dimensions

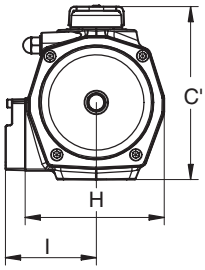
Imperial Actuators - ISO5211 / NAMUR plate

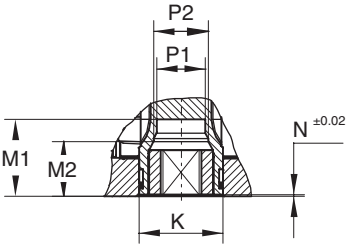


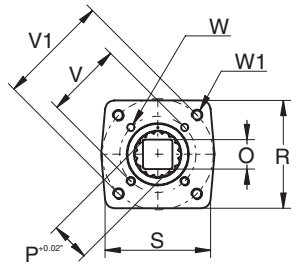


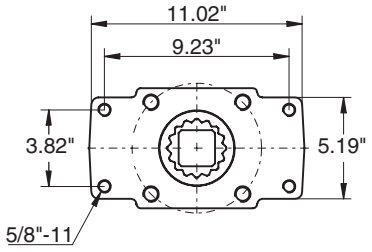












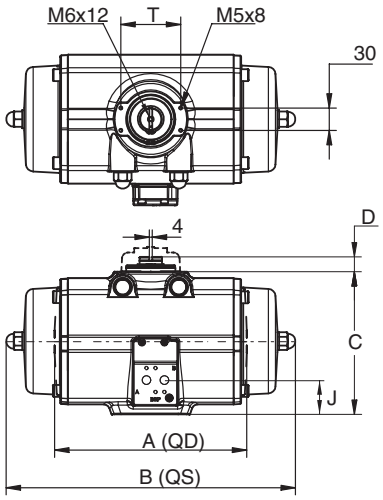
Dim. in	FieldQ™ actuator models								
inches	Q40	Q65	Q100	Q150	Q200	Q350	Q600	Q950	Q1600
A QD	5.71	6.61	7.13	8.54	9.54	10.31	12.87	14.40	17.58
B QS	7.94	9.79	9.99	12.24	14.09	15.38	16.50	18.09	22.34
C	4.09	4.59	5.55	5.91	6.34	7.52	9.65	10.87	13.27
C'	5.39	5.92	6.89	7.24	7.64	8.86	11.38	12.56	14.96
D	0.79	0.79	0.79	0.79	0.79	0.79	1.18	1.18	1.18
E	2.20	2.20	2.20	2.56	2.60	2.60	3.31	3.46	3.74
F	0.63	0.71	0.71	0.87	1.18	1.18	1.38	1.38	1.77
G	0.37	0.35	0.43	0.39	0.35	0.39	0.77	0.75	1.12
H	3.54	4.02	4.53	5.08	5.31	6.97	8.23	9.21	10.55
I	2.95	3.19	3.46	3.82	3.90	4.69	5.28	5.79	6.46
J	1.56	1.56	1.32	1.81	1.78	1.81	2.08	1.58	2.75
K	1.30	1.30	1.50	2.17	2.17	2.17	2.68	2.95	3.74
M1	1.36	1.36	1.36	1.97	1.97	1.97	2.05	2.52	3.23
M2	-	-	1.06	-	1.46	1.46	-	-	-
N	0.04	0.04	0.06	0.04	0.06	0.06	0.06	0.06	0.06
O max.	0.556	0.556	0.753	0.753	0.871	1.068	1.068	1.424	1.817
O min.	0.551	0.551	0.748	0.748	0.866	1.063	1.063	1.417	1.811
P	0.71	0.71	0.99	0.99	1.11	1.43	1.43	1.90	2.37
P1	0.71	0.71	0.91	1.12	1.26	1.26	1.44	1.91	2.38
P2	-	-	0.99	-	1.43	1.43	-	-	-
R	2.56	2.76	2.76	3.54	3.54	4.49	4.88	5.12	6.06
S	2.56	2.76	2.76	3.54	3.54	4.49	4.88	5.59	11.02
T	3.15	3.15	3.15	3.15	3.15	3.15	5.12	5.12	5.12
PCD	F05/F07	F05/F07	F05/F07	F07/F10	F07/F10	F07/F10	F10/F12	F10/F14	F16/F25*
V	1.969	1.969	1.969	2.756	2.756	2.756	4.016	4.016	6.496
V1	2.756	2.756	2.756	4.016	4.016	4.016	4.921	5.512	-
W	1/4"-20x.39	1/4"-20x.39	1/4"-20x.39	5/16"-18x.39	5/16"-18x.39	5/16"-18x.39	3/8"-16x.63	3/8"-16x.63	3/4"-10x1.14
W1	5/16"-18x.39	5/16"-18x.39	5/16"-18x.39	3/8"-16x.63	3/8"-16x.63	3/8"-16x.63	1/2"-13x.79	5/8"-11x.98	-

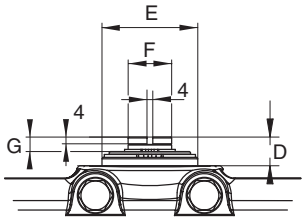
Note:

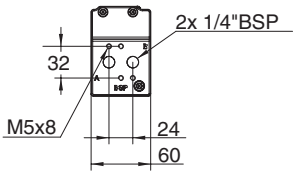
1. Dimensions are in inches.
2. The limit stop screws on the Q40 and Q65 are on the opposite side to those on the larger actuators.

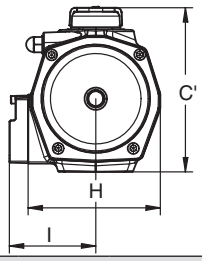
FieldQ Valve Actuator Dimensions

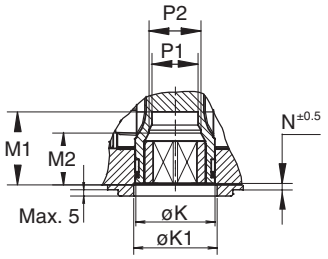
Metric Actuators - DIN3337 / NAMUR plate

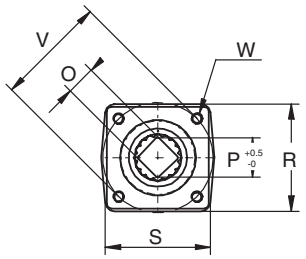


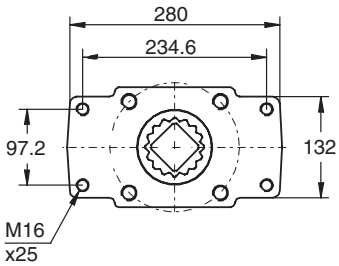












Dim	FieldQ™ actuator models								
in mm.	Q40	Q65	Q100	Q150	Q200	Q350	Q600	Q950	Q1600
A QD	145	168	181	217	242	262	327	366	447
B QS	202	249	254	311	358	391	419	460	568
C	104	116,5	141	150	161	191	245	276	337
C'	137	150,4	175	184	194	225	289	319	380
D	20	20	20	20	20	20	30	30	30
E	56	56	56	65	66	66	84	88	95
F	16	18	18	22	30	30	35	35	45
G	9,5	14	11	10	9	10	19,5	19	28,5
H	86	102	108	129	128	173	207	231	265
I	128	141,8	141	97	149	171	187	200	217
J	40	40	34	46	45	46	53	40	70
K	33	33	38	55	55	55	68	75	95
K1	32	32	40	50	54	54	68	75	95
M1	34.5	34.5	34.5	50	50	50	52	64	82
M2	-	-	27	-	37	37	-	-	-
N	1	1	1.5	1	1.5	1.5	1.5	1.5	1.5
O max.	14.11	14.11	17.13	17.13	22.13	22.13	27.13	36.16	46.16
O min.	14.00	14.00	17.00	17.00	22.00	22.00	27.00	36.00	46.00
P	18.1	18.1	22.2	22.2	28.2	28.2	36.2	48.2	60.2
P1	18.1	18.1	23.1	28.5	32.1	32.1	36.5	48.5	60.5
P2	-	-	25.2	-	36.2	36.2	-	-	-
Q	35	70	55	55	70	70	85	100	130
R	65	70	70	90	90	114	124	130	154
S	65	80	70	90	90	114	124	142	280
T	80	50	80	80	80	80	130	130	130
PCD	F05	F05	F07	F07	F10	F10	F12	F14	F16
V	50	50	70	70	102	102	125	140	165
W	M6x 10	M6x 10	M8x 13	M8x 13	M10x 16	M10x 16	M12x 20	M16x 25	M20x 30
Optional dimensions									
K1'	40	40	32	54	50	50	-	-	-
Q'	55	35	35	70	55	55	-	-	-
PCD	F07	F07	F05	F10	F07	F07	F10	F10	F25*
V'	70	70	50	102	70	70	102	102	-
W'	M8x 13	M8x 13	M6x 10	M10x 16	M8x 13	M8x 13	M10x 16	M10x 16	-

FieldQ Valve Actuator Options

Drive Inserts

Description

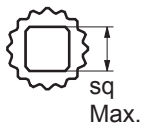
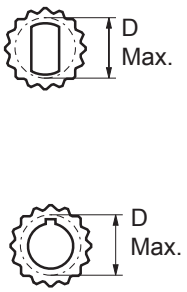
All actuators are fitted with drive inserts. This enables actuators to be directly mounted onto suitable valves and eliminates the need for a bracket and coupling type mounting kit. The use of direct mounts significantly cuts the cost of the valve/actuator assembly.

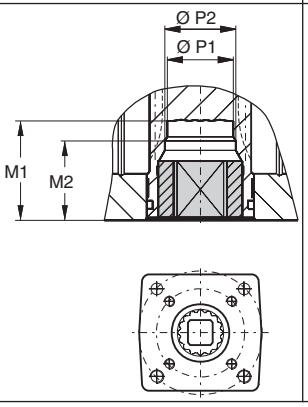
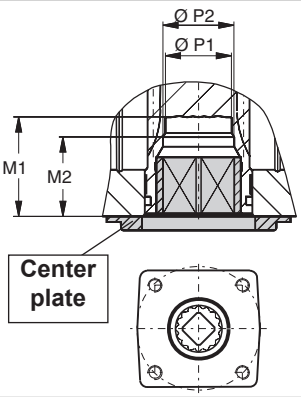
Standard actuators are fitted with square drive inserts in accordance with ISO 5211 (or DIN 3337), but a wide variety of other inserts are also available. Special inserts may have oversize or undersize squares, double-D and shaft key way forms.

Drive inserts can be supplied on factory built actuators or as loose items and are easily replaceable at distributor or end user level.

Where direct mounts are not possible, for instance on valves with exposed gland packing, the use of inserts often simplifies the design of the mounting kit.

Material : Aluminum alloy
Finish : Anodized

Standard available insert shapes	Optional available insert shapes
	

Insert mounting acc. ISO 5211	Insert mounting acc. DIN 3337
	

	Inserts with inner-square-dimensions per actuator type																	
	Q40		Q65		Q100		Q150		Q200		Q350		Q600		Q950		Q1600	
	mm.	inch	mm.	inch	mm.	inch	mm.	inch	mm.	inch	mm.	inch	mm.	inch	mm.	inch	mm.	inch
	Standard inserts dimensions																	
ISO5211	14	0.551	14	0.551	19	0.748	19	0.748	22	0.866	27	1.063	27	1.063	36	1.417	46	1.811
DIN3337	14	0.551	14	0.551	17	0.669	17	0.669	22	0.866	22	0.866	27	1.063	36	1.417	46	1.811
	Optional insert dimensions																	
	10	0.394	10	0.394	12	0.472	14	0.551	14	0.551	14	0.551	14	0.551	22	0.866	-	-
	12	0.472	12	0.472	14	0.551	16	0.630	16	0.630	16	0.630	16	0.630	-	-	-	-
	-	-	-	-	16	0.630	22	0.866	17	0.669	17	0.669	17	0.669	-	-	-	-
	-	-	-	-	-	-	24	0.945	19	0.748	19	0.748	19	0.748	-	-	-	-
	-	-	-	-	-	-	27	1.063	24	0.945	24	0.945	24	0.945	-	-	-	-
	Maximum insert dimensions																	
M1	34.5	1.36	34.5	1.36	34.5	1.36	50	1.97	50	1.97	50	1.97	50	1.97	65	2.56	81	3.19
M2	-	-	-	-	27	1.06	37.0	1.46	37.0	1.46	37.0	1.46	-	-	-	-	-	-
P1	18.1	0.71	21.2	0.83	23.5	0.93	28.5	1.12	32.2	1.27	32.2	1.27	36.8	1.45	48.3	1.90	60.5	2.38
P2	-	-	-	-	25.2	0.99	36.2	1.43	36.3	1.43	36.3	1.43	-	-	-	-	-	-
Sq max.	16	0.630	16	0.630	19	0.748	27.0	1.063	27.0	1.063	27.0	1.063	27.0	1.063	36.0	1.417	46.0	1.811
D max.	21	0.827	21	0.827	23.6	0.929	33.6	1.323	33.6	1.323	33.6	1.323	33.6	1.323	45.0	1.772	60.0	2.362

FieldQ Valve Actuator Options

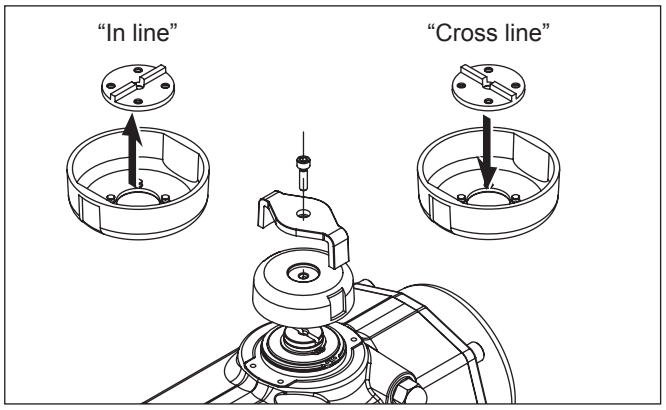
Position Indication - Center Plate

Visual position indicator

FieldQ valve actuators can be equipped with a large visual position indicator which allows clear indication of the valves position at almost any position.
The FieldQ indicator is designed for position indication of actuators mounted “in line” with the pipe line and mounted “cross line” with the pipe line. To do this the inner part can be removed, turned 90° and pushed back in place.
When supplied, the position indicator will be mounted “in line” as standard. See data sheet 1.606.04 for other indicator mounting options.

Specifications:

Material disk : Nylon PA6, Black
Material arrow : Nylon PA6, Yellow

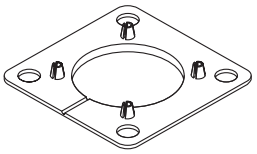


Center plate for DIN3337 applications

FieldQ actuators can be equipped with a centre plate which takes care that actuator and valve (or valve mounting kit) are aligned when mounted. For most of the actuator sizes two center plates are available.

Specifications:

Material plate : Nylon PA6, Black



Center plate

	FieldQ™ actuator models							
	Q40	**Q65**	**Q100**	**Q200**	**Q350**	**Q600**	**Q950**	**Q1600**
Std	F05	F05	F07	F10	F10	F12	F14	F16
Option	F07	F07	F05	F07	F07	-/-	-/-	-/-

FieldQ Valve Actuator Options

NAMUR Plate

Description

The top flange of the FieldQ actuator is standard equipped with a NAMUR drilling pattern. The addition of a NAMUR adaptation plate makes the FieldQ actuator suitable for mounting all kinds of NAMUR compatible control and feedback accessories like solenoids, switch boxes or positioners.

Backwards compatibility

Where the FieldQ is meant to be a integrated concept for valve automation, there are a number of reasons for also having NAMUR interfaces:

Emergency repairs

- When the Control Module requires immediate repair and the process can only be stopped for a limited time, it would be easy to mount standard available NAMUR accessories.

Future updates

- When a plant is not yet ready for digital (bus) communication, but will be upgraded in the (near) future towards this technology, it is easy to change from NAMUR accessories to a FieldQ with bus communication.

Available equipment

- NAMUR compatible accessories are easy to acquire. Many suppliers offer accessories that can be fitted to NAMUR actuator interfaces.

Construction

The NAMUR adaptation plate is fitted in front of the actuator part of the FieldQ and replaces in fact the Pneumatic Module.

Specifications:

Material	: Aluminum
Air connection	: 1/4” BSP or 1/4” NPT
Finish	: Housing : Anodized with a polyester non-TGIC based powder coating
	: Pistons : Chromatized
Fasteners	: Stainless Steel
Seals	: Nitrile Rubber O-rings

Optional Temperature ranges

Special selected O-ring seals and grease makes it possible to utilize the FieldQ actuator, with NAMUR plate, for various temperature ranges. Three temperature ranges are available:

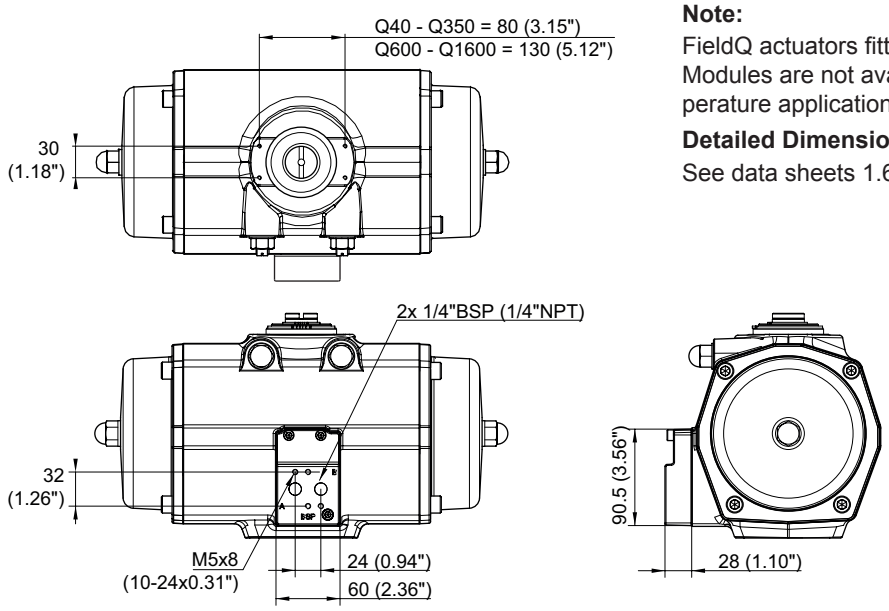
- **Option code ST :** 80°C (176°F) / -20°C (-4°F)
  O-ring seals : Nitrile rubber
  Grease : Castrol LMX
- **Option code HT :** 120°C(248°F) / -20°C (-4°F)
  O-ring seals : Fluoro rubber (FPM) Viton®
  Grease : Castrol LMX
- **Option code LT :** 80°C (176°F) / -40°C (-40°F)
  O-ring seals : Silicone MVQ 70
  Grease : Castrol Optitemp TT1

Note:

FieldQ actuators fitted with Pneumatic Modules and Control Modules are not available for high temperature or low temperature applications.

Detailed Dimensions

See data sheets 1.603.05, 1.603.06 and 1.603.07.



Smart - Control Modules

QC01: (24VDC) & QC02: (85-254VAC/VDC)

Description:

These FieldQ QC01 and QC02 Smart Control Modules offer an integrated concept for “On/Off” valve automation. Its compact and robust construction incorporates IPT technology with auto-initialization for easy setting of feedback switches.

Construction:

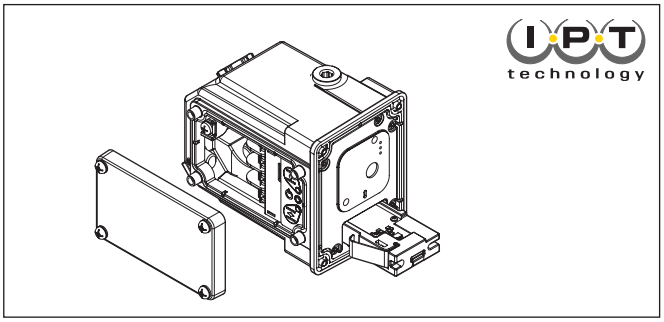
The Control Module is mounted at the side of the Pneumatic Module in front of the basic actuator housing. Inside are terminals available for connecting control and feedback wiring. Two cable entries are available for this purpose.

Features:

- **Supports both single and double acting actuators.**
- **One entry for all wiring** (control and feedback).
- **IPT-technology** (Intelligent Position Tracking).
- **Automatic initialization** for easy setup of the actuator. **Pressing 4 seconds** simultaneously the “Open” and “Closed” reassignment buttons starts auto-initialization procedure and sets automatically the feedback limit switches.
- **Readjustable or Reversible position feedback** using the reassignment buttons.
- **Three indication LED’s** for “Status”, “Open” and “Closed” position. Status LED indicates:

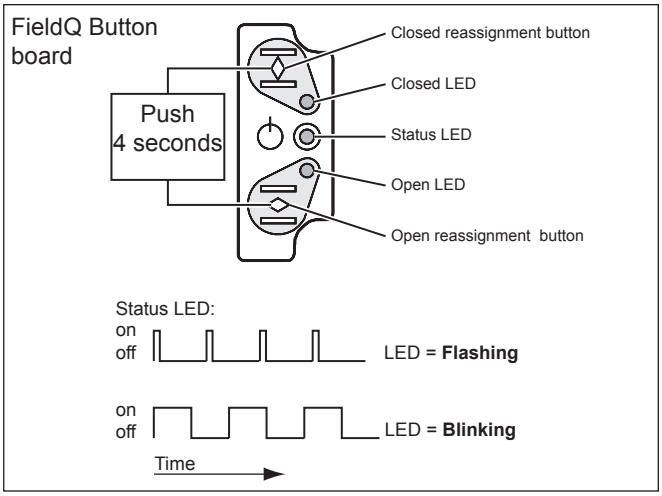
Initialization procedure running	Blinking
Successful initialization procedure	LED is on
No or failed initialization	Flashing

- Control Module **is easily plugged in** the Pneumatic Module.
- Modular functionality for **easy update** towards present and future bus systems.
- **The power supply and all inputs and outputs are galvanic isolated** which offers greater flexibility for systems connection.



General Specifications:

Material housing	: Aluminium alloy
Cable entries	: 2x M20x1.5 or 2x 1/2”NPT
Electrical connections	: Internal terminal strip.
Enclosure	: IP65 / NEMA 4X
Finish	: Polyester non-TGIC based powder coating.
Operating media	: Air or inert gasses, filtered at 50 micron
Temperature	: -20° to +80°C / -4° to 176°F
Dimensions	: See data sheet : 1.603.01 - metric 1.603.04 - imperial/UNC 1.603.02 - DIN 3337



Smart - Control Modules

QC01: (24VDC) & QC02: (85-254VAC/VDC)

Options:

Manual Control

Can be added as kit or factory option in 2 versions, “Push button” or a “Push and lock” button.

Glands and plugs

FieldQ Control Modules QC01 or QC02 can be shipped with plastic or metal glands (M20x1.5 or 1/2”NPT) and rated IP65/ NEMA4X or higher.

Hazardous area modules:

- **Non-Incendive of Non-Sparking**
  Control Modules QC01 and QC02 are available with optional Non-Incendive of Non-Sparking approvals as listed below:

  - **IECEx** : ExnA II T4
    : Ex tD A22 T90°C / IP65
    : Certificate : KEM 07.0046X

  - **ATEX** : Ⓔx II 3 G Ex nA II T4
    : Ⓔx II 3 D Ex tD A22 T90°C / IP65
    : Certificate : KEMA 02ATEX1258X

  - **FM** : Non-Incendive, Class I, II, III, Div.2, Group ABCDFG T4, Type 4X/IP65
    : Class I, Zone 2, IIC T4

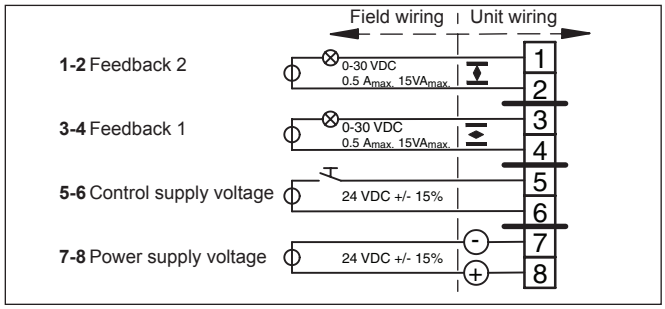
  - **CSA** : Non Incendive: Class I, II, III, Div.2, Groups ABCDFG, T4
    : Ex nA II T4 (Class I, Zone 2)
    : Certificate: 1477696

  Ambient temperature:
  T4 @ Ta = : QC01: -20°C…+75°C (-4°F…167°F)
  : QC02: -20°C…+73°C (-4°F…163°F)

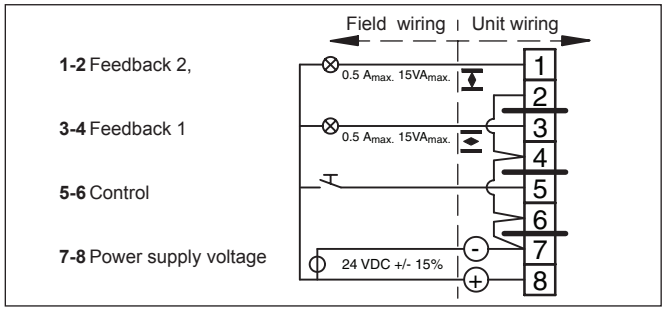
- **Intrinsically safe:**
  For information about intrinsically safe Control Modules, see 1.604.011
- **Short circuit monitoring and line break detection**
  For information about Control Modules with short circuit monitoring and line break detection (IEC 60947 part 5-6, NAMUR switch characteristics), see 1.604.011

Wiring & Electrical Specifications QC01 & QC 02

QC01



QC01, 24VDC electric connections, separate circuits



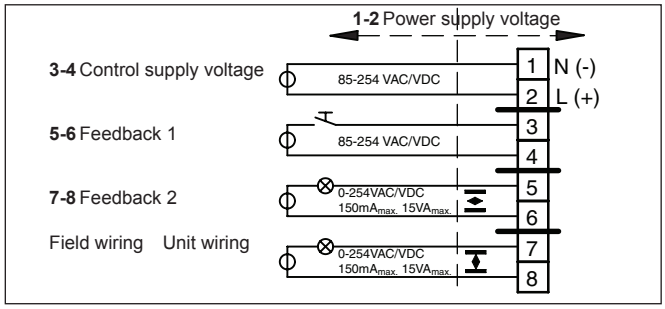
QC01, 24VDC electric connections, common "-"

Electrical data QC01 : 24VDC

Power supply input:	
Voltage	24 VDC (±15%)
Maximum current	125 mA
Power (nominal)	2.5 W
Control signal input:	
Voltage	24 VDC (±15%)
Maximum current	5 mA
Contacts	Potential free
Feedback switches output:	
Voltage	0-30 VDC
Current DC	500 mA (maximum)
	1 mA (advised minimum)
Resistance (nom.)	0.5 Ohm (On state)
Maximum power	15 W
Electric contacts	Potential free
Polarity:	
Dependent	Power supply
Independent	Control signal + feedback switches.

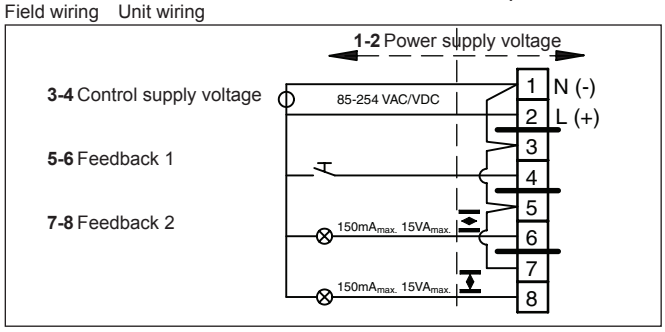
- For Non-Incendive (Cl. I Div2) or Non-Sparking (Zone 2) hazardous area applications, see Installation Guide : DOC.IG.QC01.1

QC02



QC02, 85-254 VAC/VDC electric connections, separate circuits

Field wiring Unit wiring



QC02, 85-254 VAC/VDC electric connections, single power

Electrical data QC02 - 85-254 VAC/VDC

Power supply input:	
Voltage	85-254 VAC/VDC (rated mains 95-230V) 50/60Hz
Maximum current (*	60 mA
Power (nominal)	2.8 W
Control signal input:	
Voltage	85-254 VAC/VDC, 50/60Hz
Maximum current	2.5mA at 115 V
	5mA at 230 V
Feedback output:	
Voltage	0-254 VAC/VDC, 50/60Hz
Maximum current	150mA (AC or DC)
Maximum power	15 W
Electric contacts	Potential free

(* The QC02 module has a fuse in the supply live line. It is not allowed to replace this fuse in the field.

- For Non-Incendive (Cl. I Div2) or Non-Sparking (Zone 2) hazardous area applications, see Installation Guide : DOC.IG.QC02.1

Smart - Control Modules

QC03: IS, QC04: IS-NAMUR, Intrinsically safe

Description:

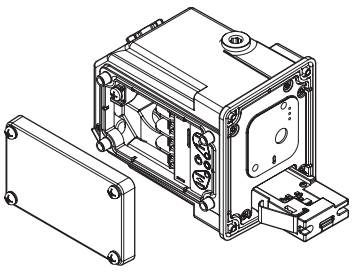
These variations of the FieldQ Smart Control Module offers, an intrinsically safe concept for “On/Off” valve automation. Its compact and robust construction incorporates the same IPT technology and same functionalities as all the other FieldQ Smart Modules have.

Construction:

The Control Module is mounted at the side of the Pneumatic Module in front of the basic actuator housing. Inside are terminals available for connecting control and feedback wiring. Two cable entries are available for this purpose.

Features:

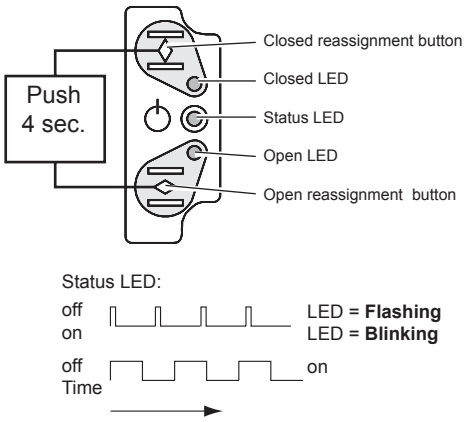
- **Supports both single and double acting actuators.**
- **One entry for all wiring** (control and feedback).
- **IPT-technology** (Intelligent Position Tracking).
- **Automatic initialization** for easy setup of the actuator. **Pressing 4 seconds** simultaneously the “Open” and “Closed” reassignment buttons starts auto-initialization procedure and sets automatically the feedback limit switches.
- **Readjustable or Reversible position feedback** using the reassignment buttons.
- **Three indication LED’s** for “Status”, “Open” and “Closed” position. Status LED indicates:
  - Initialization procedure running (blinking)
  - Successful initialization procedure (LED is on)
  - No or failed initialization (flashing)
- Control Module **is easily plugged in** the Pneumatic Module.
- Modular functionality for **easy update** towards present and future bus systems.
- **The power supply and all inputs and outputs are galvanic isolated** which offers greater flexibility for systems connection.



General Specifications:

Material housing	: Aluminium alloy
Cable entries	: 2x M20x1.5 or 2x 1/2”NPT
Electrical connections	: Internal terminal strip.
Enclosure	: IP65 / NEMA4X
Finish	: Polyester non-TGIC based powder coating.
Temperature	: -20° to +50°C / -4° to 122°F
Operating media	: Air or inert gasses, filtered at 5 micron
Dimensions	: See 1.603.01 for ISO 5211 (metric) See 1.603.04 for ISO 5211 (Imperial, UNC). See 1.603.02 for DIN 3337

FieldQ Button board

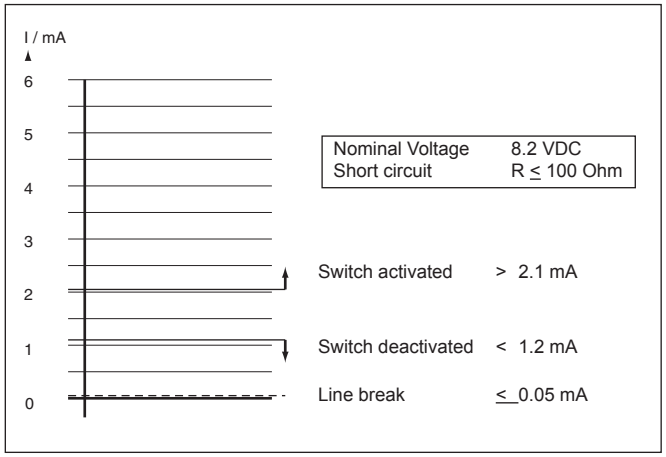


Smart - Control Modules

QC03: IS, QC04: IS-NAMUR, Intrinsically safe

QC04 Short circuit monitoring and line break detection

Control Module QC04 is additionally equipped with NAMUR feedback according IEC 60947 part 5-6 (VDE 0660 sec. 212). In combination with a switch amplifier according this same standard, it offers next to feedback short circuit monitoring and line break detection.



Switch characteristics of NAMUR feedback outputs according IEC60947-5-6.

Options:

Manual Control

- Can be added as kit or factory option in 2 versions, “Push button” or a “Push and lock” button.

Glands and plugs

- FieldQ Control Modules QC03 or QC04 can be shipped with plastic or metal glands (M20x1.5 or 1/2”NPT) and rated IP65/NEMA4X or higher.

Intrinsically safe approvals:

Control Modules QC03 and QC04 have standard intrinsically safe approvals as listed below:

- **IECEx** : Ga Ex ia IIC T4
  : Ex iaD 20 T80°C / IP65
  : Certificate : KEM 07.0045X
- **ATEX** : Ⓔx II 1 G Ex ia IIC T4
  : Ⓔx II 1 D Ex iaD 20 T80°C / IP65
  : Certificate : KEMA 02ATEX1242X
- **FM** : Intrinsically safe, Class I, II, III Div.1, Groups ABCDEFG, T4, Type 4X/IP65
  : Class I, Zone 0, AEx ia IIC T4, IP65,
- **CSA** : Intrinsically safe, Class I, II, III Div.1, Groups ABCDEFG, T4
  : Ex ia IIC T4, IP65, (Class I, Zone 0/1)
  : Ta = -20°C…+50°C (-4°F…122°F)
  : Certificate: 1477696

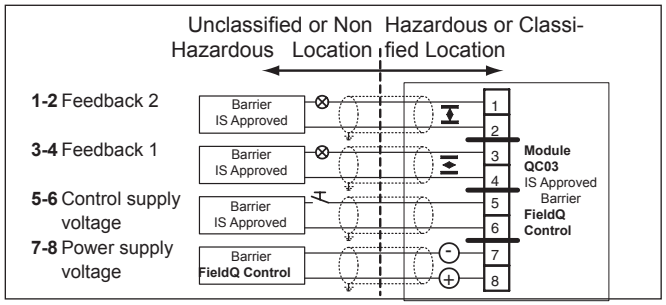
Ambient temperature:
T4 @ Ta = : -20°C...+50°C

Note:

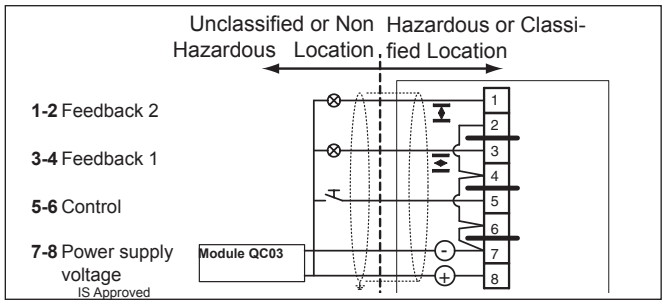
* The assembly of a FieldQ Actuator with the intrinsically safe QC03 or QC04 Control Module, may be used in (ATEX) classified Zones 1, 2 (Gasses) and/or 21, 22 (Dust).

Wiring & Electrical Specifications QC03 & QC04

QC03 IS



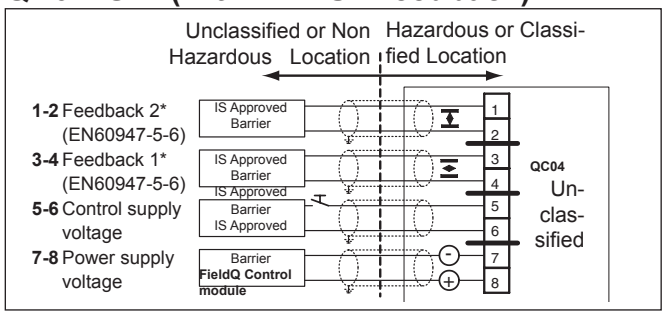
QC03, Terminal connections, with separate circuits



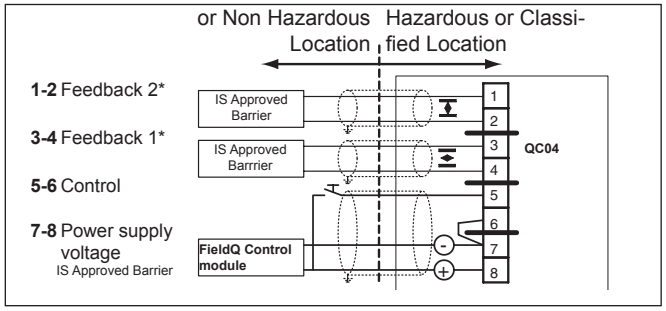
QC03, Terminal connections with common "-"

Electrical data	QC03 - IS	QC04 - IS-N
Power supply input:		
Voltage	13.5 - 27.6 V	13.5 - 27.6 V
Maximum current (@14V)	26 mA	26 mA
Maximum Power	1.2 W	1.2 W
Capacity Ci (max.)	15 nF	15 nF
Inductivity Li	0 mH	0 mH
Control signal input:		
Voltage	6 - 30 V	6 - 30 V
Maximum current	5 mA	5 mA
Capacity Ci (max.)	3.2 nF	3.2 nF
Inductivity Li	0 mH	0 mH
Contacts	Potential free	Potential free
Feedback outputs:		
Maximum voltage	30 VDC	IEC 60947-5-6
Maximum current	32 mA	IEC 60947-5-6
Resistance (nom.)	440 Ohm	440 Ohm
Switch resistance	300kOhm	10440 Ohm
(off-state)		
Maximum power	1.2 W	IEC 60947-5-6
Electric contacts	Potential free	IEC 60947-5-6
Temperature	-20°C to +50°C (-4°F to +122°F)	

QC04 IS-N (with NAMUR feedback)



QC04, Terminal connections with seperate circuits



QC04, Terminal connections with common "-" for control & power supply

Cable range:
Wire range : 2.5mm² max.
Solid / Stranded wire : 0.2-3.3mm² or 24-12 AWG

Feedback 1 and 2 on QC03:
- Use approved barriers.

Feedback 1 and 2 on QC04:
- Use barrier according EN60947-5-6 (NAMUR) for appropriate signal level. Un = 8.2VDC

QC03 / QC04 Intrinsically Safe Entity Parameters

Circuit	Terminal	Ui	Ii	Pi	Ci	Li
Power Supply	7-8	30VDC	300mA	1.2W	15 nF	0
Control input	5-6	30VDC	300mA	1.2W	15 nF	0
Feedback 1	3-4	30VDC	300mA	1.2W	18 nF	0
Feedback 2	1-2	30VDC	300mA	1.2W	18 nF	0

For more detailed information on Intrinsically safe (Cl. I Div1 / Zone 1) installations, see Installation Guide DOC.IG.QC01.1

Smart - Control Modules

QC34: FOUNDATION™ fieldbus

Description:

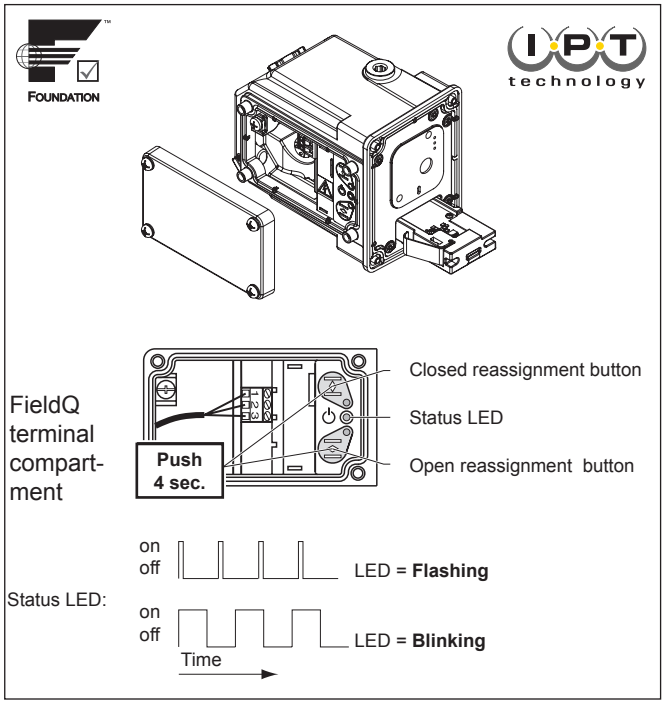
This FieldQ Control Module offers an integrated concept for valve automation. Its compact and robust construction incorporates basic control and feedback functionality and communicates through the FOUNDATION™ fieldbus protocol.

Construction

The Control Module is mounted at the side of the Pneumatic Module in front of the basic actuator housing. Inside are terminals available, for connecting the bus wiring and a button board. Two cable entries are available for this purpose.

Features

- **FOUNDATION™-Fieldbus** digital communication.
- **Supports PlantWeb Alerts**.
- **Supports NAMUR NE-107 Alarms**
- **Supports both single and double acting actuators.**
- **One entry for all wiring** (control and feedback).
- **IPT-technology** (Intelligent Position Tracking).
- **Initialization by FOUNDATION fieldbus or Push-button** for easy setup of the actuator.
  Pressing 4 seconds simultaneously the “Open” and “Closed” reassignment buttons starts auto-initialization procedure and sets automatically the feedback limit switches.
- **Readjustable or Reversible position feedback** using the re-reassignment buttons or by FOUNDATION fieldbus.
- **Adjustable switch points** can be adjusted from 5% to 30% before the end of the stroke by FOUNDATION fieldbus.
- **Three indication LED’s** for “Status”, “Open” and “Closed” position. Status LED indicates:
  - Initialization procedure running (blinking),
  - Successful initialization procedure (LED is on) or
  - No or failed initialization (flashing)
- Control Module **can be easily plugged** in the Pneumatic Module.



General specifications

Material housing	:	Aluminium alloy
Cable entries	:	2x M20x1.5 or 2x 1/2”NPT
Electrical connections	:	Internal terminal strip.
	:	Optional quick connectors: 7/8” or M12 connector (see page 2)
Enclosure	:	IP65 / NEMA 4X
Finish	:	Polyester non-TGIC based powder coating.
Operating media	:	Air or inert gasses, filtered at 5 micron.
Temperature	:	-20° to +50°C / -4° to 122°F
Dimensions	:	See 1.603.01 metric
		See 1.603.04 imperial/UNC
		See 1.603.02 DIN 3337

Communication Protocol:

Protocol	: FOUNDATION™ fieldbus
Transmission	: H1, IEC 61158-2
Maximum current	: 18mA from bus
Required external protection	: Restrict the power supply current to <600mA.

Function blocks

The Control Module provides the following function blocks:
- Resource Block (RB)
- Transducer Block (TB)
- Analog Input (AI) Function Block
- Discrete Output (DO) Function Block
- 2x Discrete Input (DI) Function Block
- PID Function Block

Diagnostics and Alerts

Standard FOUNDATION fieldbus diagnostics and alerts provided meets Emerson PlantWeb Alerts standard.
Applicable diagnostics include:
- Travel times for the Open stroke, Close stroke and Average travel times.
- Cycle Counters for Control Module, Pneumatic Module, Actuator and Valve
- Time in Position
- Various internal electronic health tests.
- Instrument temperature.

For more detailed information on diagnostics see page 3 and 4.

Options:

Manual Control
- Can be added as kit or factory option in 2 versions, “Push button” or a “Push and lock” button.

Glands, plugs and quick connectors
- FieldQ Control Modules can be shipped with plastic or metal glands (M20x1.5 or 1/2”NPT) and rated IP65 or higher or a prewired quick connector.

Hazardous area executions:

Control Module QC34 with FOUNDATION fieldbus is available with optional intrinsically safe (IS) or Non-Incendive/Non Sparking (NI) approvals as listed below:

- **IECEx**: **Certificate :** KEM 07.0045X
  : Intrinsically safe*
  : Ga Ex ia IIC T4
  : Ex iaD 20 T80° / IP65
  : **Certificate :** KEM 07.0046X
  : Non-Sparking
  : Ex nA II T4
  : Ex nL IIC T4
  : Ex tD A22 T80°C
- **ATEX** : **Certificate :** KEMA 02ATEX1242X
  : Intrinsically safe*
  : Ⓔx II 1 G Ex ia IIC T4
  : Ⓔx II 1 D Ex iaD 20 T80° / IP65
  : Certificate : KEMA 02ATEX1258X
  : Non-Sparking
  : Ⓔx II 3 G Ex nA II T4
  : Ⓔx II 3 G Ex nL IIC T4
  : Ⓔx II 3 D Ex tD A22 T80°C
- **FM** : **Intrinsically safe**, Class I, II, III Div.1, Groups ABCDEFG, T4, Type4X/IP65
  : Class I, Zone 0, AEx ia IIC T4
  : **Non Incendive**, Class I, II, III, Division 2,
  : Groups ABCDFG, T4, Type 4X/IP65
  : Class I, Zone 2, IIC T4, Type 4X/IP65
- **CSA** : **Certificate**: 1477696
  : **Intrinsically safe**, Class I, II, III Div.1, Groups ABCDEFG, T4
  : Ex ia IIC T4, IP65, (Class I, Zone 0/1)
  : **Non Incendive**: Class I, II, III Div.2, Groups ABCDFG, T4
  : Ex nA II T4 (Class I, Zone 2)
  : Ex nL II T4 (Class I, Zone 2)

Ambient temperature:
T4 @ Ta = : -20°C...+50°C IP65

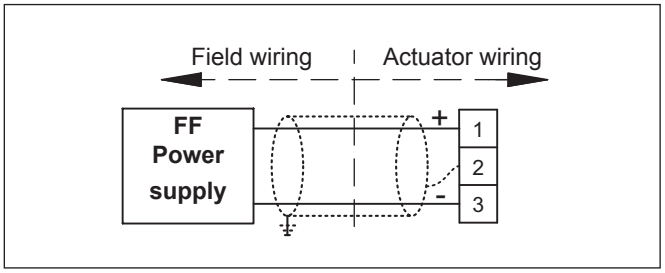
Note:
* The assembly of a FieldQ Actuator with the intrinsically safe QC34 Control Module, may be used in (ATEX) classified Zones 1, 2 (Gasses) and/or 21, 22 (Dust).

FISCO & FNICO systems

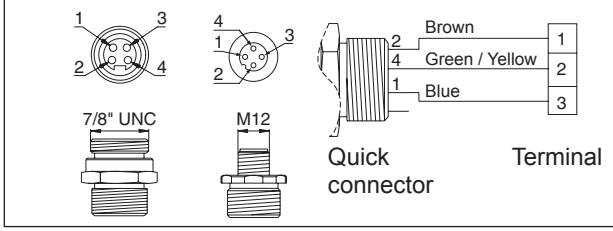
The FieldQ QC34 is suitable for use in a FISCO or FNICO system in accordance with IEC 60079-27 :2005

FOUNDATION™ fieldbus terminal wiring

Standard PI-filter present.
Detailed Intrinsically safe or Non-Incendive/Non-Sparking wiring instructions, will be shipped with the product, see Installation Guide : DOC.IG.QC34.1



Quick connector pinouts:
(male chassis part)



Wiring dimensions

Solid wire : 2.5mm² max.
Stranded wire : 0.2-3.3mm² or 24-12 AWG

Quick connector pinouts:

- The FOUNDATION fieldbus Module can optionally be equipped with prewired quick connectors. Two versions are available: 7/8" or M12 (male chassis part).
- Quick connectors, as shown below are excluded for non-Incendive or non-sparking use in hazardous area's classified as Zone 2 or 22 or Cl I, II, III, Div. 2.

Diagnostics and PlantWeb Alerts QC34 FOUNDATION fieldbus

The FieldQ Control Module with FOUNDATION fieldbus communication has diagnostic capabilities. These process parameters can give information about communication condition, valve and/or actuator unit. It enables to predict failures in advance and makes maintenance easier to schedule. The following diagnostics are available for the FieldQ:

1 Timer parameters:
1. Open and Closed travel time
2. High and low limits of Open and Closed travel time
3. Average travel times of last 30 strokes of Open and Closed travel.
4. High and low limits of average Open and Closed travel time

2 Cycle Counters
1. Control Module - Counts how many times the Control Module cycles (read only).
2. Pneumatic Module - Counts how many times the Pneumatic Module cycles.
3. Actuator - Counts how many times the actuator cycles.
4. Valve - Counts how many times the valve cycles.

3 Time In Position

4 Various internal electronic health tests.

PlantWeb Alerts

PlantWeb Alerts are alerts that have been predefined and categorized for the user. These device alerts can be used to help troubleshoot the instrument (see also page 4). There are three categories:

- **Failed alerts,**
  A failed alert indicates a failure within the device that will make the device, or some part of the device, non-operational.
- **Maintenance alerts**
  A maintenance alert indicates that the device, or some part of the device, needs maintenance soon.
- **Advisory alerts**
  An advisory alert indicates a condition that does not have a direct impact on the device's primary function. If the condition is ignored, the device will eventually fail.

These alerts, when enabled, can participate in the DeltaV alarm interface tools such as the alarm banner, alarm list, and alarm summary.

Diagnostics and PlantWeb Alerts

Alerts & recommended actions			Alert default setting					
			Advisory		Maintenance		Fail	
Alerts		Recommended actions	enable	mask *	enable	mask *	enable	mask *
bit 0	Reserved							
bit 1	Internal alerts, bad position sensor	Feedback problem, replace control module when possible	n	n	y	y	n	n
bit 2	Internal alerts, bad temperature sensor	Temperature sensor problem, replace Control Module when possible	n	n	y	y	n	n
bit 3	Internal alerts, Specified system temperature exceeded	Take corrective actions to bring temperature within specified range.	n	n	y	y	n	n
bit 4	Internal alerts, Software error		n	n	y	n	n	n
bit 5	Internal alert, travel deviation	Lost position, Check air pressure	y	y	n	n	n	n
bit 6	Internal alerts, Shutdown is set	Internal communications problem, check shutdown configuration for restart, Replace Control Module.	n	n	n	n	y	y
bit 7	Internal alerts, Undefined error		n	n	y	n	n	n
bit 8	Counter alerts, Control Module life cycle exceeded	Control Module life cycle exceeded, Replace Control Module	n	n	y	y	n	n
bit 9	Counter alerts, Pneumatic Module life cycle exceeded	Pneumatic Module life cycle exceeded, Replace Pneumatic Module.	n	n	n	n	n	n
bit 10	Counter alerts, Actuator life cycle exceeded	Actuator life cycle exceeded, Replace actuator.	n	n	n	n	n	n
bit 11	Counter alerts, Valve life cycle exceeded	Valve life cycle exceeded, take Valve requires maintenance.	n	n	n	n	n	n
bit 12	Timer alerts: time in position limit	Time in position exceeded, appropriate action.	n	n	n	n	n	n
bit 13	Timer alerts: open travel time limit exceeded	Open travel timer exceeded, check valve system.	n	n	n	n	n	n
bit 14	Timer alerts: close travel time limit exceeded	Close travel timer exceeded, check valve system.	n	n	n	n	n	n
bit 15	Initialization Failed (reason from AUTO_INITIALIZATION STATUS)	Check air pressure, check actuator sizing, check valve system.	y	y	n	n	n	n
bit 16	Reserved Primary Value Failure							
bit 18	Reserved HW/SW Incompatibility		n	n	n	n	n	n
bit 19	Reserved IO Failure (FF card lost IO board)	Internal communications are lost, device will act according to shutdown configuration.	y	y	n	n	n	n
bit 20	Reserved Mechanical Failure							
bit 21	Reserved TB NV Memory Failure							
bit 22	Reserved RB NV Memory Failure		y	y	n	n	n	n
bit 23	Reserved TB Electronics Failure		y	n	n	n	n	n
bit 24	Reserved RB Electronics Failure		y	y	n	n	n	n

*) Mask “n” indicates masked out (not visible).
For more detailed information about the configuration of the QC34 FOUNDATION™ fieldbus Module see Reference Manual DOC.RM.QC34.E. This manual is available for download from www.FieldQ.com.

Namur NE-107 Alarms

This section describes the parameter interaction to implement a FieldQ™ QC34 Control module to the NAMUR NE-107 requirements as a parameter group in the Resource Block. There are four alarm categories defined as per the NE-107 specification, Failed, Off Specification, Maintenance, and Check function.

Maintenance Although the output signal is valid, the wear reserve is nearly exhausted or a functions will soon be restricted due to operational conditions e.g. build-up of deposits

Off Specification Off-spec means that the device is operating outside its specified range or an internal diagnostic indicates deviations from measured or set values due to internal problems in the device or process characteristics (e.g. bubble formation in flow metering or valve sticking).

Check Function Output signal temporarily invalid (e.g. frozen) due to on-going work on the device.

Failed Output signal invalid due to malfunction in the field device or its peripherals.

Each of these categories share 32 conditions that can be defined by the device manufacturer. Each condition may be mapped or not mapped for each category. If a condition is mapped then it is indicated in the* ACTIVE parameter. If the condition in the * ACTIVE parameter is not masked by the corresponding bit in the *_MASK parameter then the condition will be queued for broadcast using the corresponding *ALM parameter at the associated priority indicated by *PRI parameter. The 4 categories are defined below.

The conditions are not expected to identify explicitly the root cause of the condition, but rather to identify it in terms of:

- Replace the device
- Replace a part of the device
- Correct a configuration problem
- Fix something outside of the device

The above list is all that the operator needs to know to restore his process functionality and if there are more than 31 device conditions they should be grouped by definition into these bit

Parameter Mnemonic	Obj Type	Data Type/ Structure	Use/Model	Store	Size	Valid Range	Initial Value	Permission	Other	Range Check
FD_CHECK_ACTIVE	S	Bit String	C/FD Active	D	4				Read only	
FD_CHECK_ALM	R	DS-87	C/Alarm	D	15					
FD_CHECK_MAP	S	Bit String	C/Contained	S	4			ALARM		
FD_CHECK_MASK	S	Bit String	C/Contained	S	4			ALARM		
FD_CHECK_PRI	S	Unsigned8	C/Alert Priority	S	1	0 - 15	0	ALARM		Yes
FD_EXTENDED_ACTIVE_n	S	Bit String	C/Contained	D	4				Read only	
FD_EXTENDED_MAP_n	S	Bit String	C/Contained	S	4					
FD_FAIL_ACTIVE	S	Bit String	C/FD Active	D	4				Read only	
FD_FAIL_ALM	R	DS-87	C/Alarm	D	15					
FD_FAIL_MAP	S	Bit String	C/Contained	S	4			ALARM		
FD_FAIL_MASK	S	Bit String	C/Contained	S	4			ALARM		
FD_FAIL_PRI	S	Unsigned8	C/Alert Priority	S	1	0 - 15	0	ALARM		Yes
FD_MAINT_ACTIVE	S	Bit String	C/FD Active	D	4				Read only	
FD_MAINT_ALM	R	DS-87	C/Alarm	D	15					
FD_MAINT_MAP	S	Bit String	C/Contained	S	4			ALARM		
FD_MAINT_MASK	S	Bit String	C/Contained	S	4			ALARM		
FD_MAINT_PRI	S	Unsigned8	C/Alert Priority	S	1	0 - 15	0	ALARM		Yes
FD_OFFSPEC_ACTIVE	S	Bit String	C/FD Active	D	4				Read only	
FD_OFFSPEC_ALM	R	DS-87	C/Alarm	D	15					
FD_OFFSPEC_MAP	S	Bit String	C/Contained	S	4			ALARM		
FD_OFFSPEC_MASK	S	Bit String	C/Contained	S	4			ALARM		
FD_OFFSPEC_PRI	S	Unsigned8	C/Alert Priority	S	1	0 - 15	0	ALARM		Yes
FD_RECOMMEN_ACT	S	Unsigned16	C/Contained	D	2	1 – manf spec	0		Read only	
FD_SIMULATE	R	DS-89	C/FD Simulate	D	9		disabled			
FD_VER	S	Unsigned16	C/Contained	S	2				Read only	

Smart - Control Modules

QC30: AS-Interface

Description:

This FieldQ Control Module offers an integrated concept for valve automation. Its compact and robust construction incorporates basic control and feedback functionality and communicates through the ASI 2 or ASI 1 protocol.

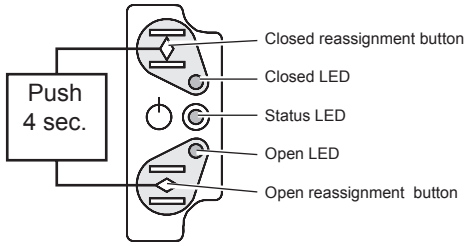
Construction

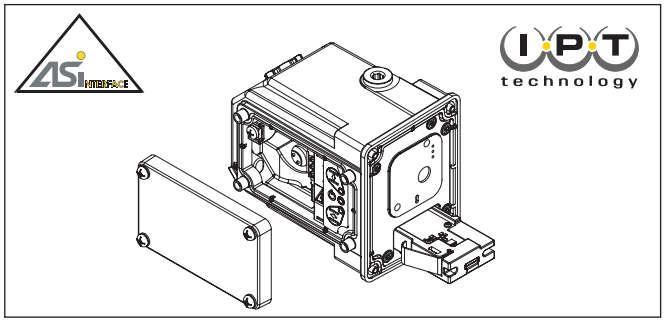
The Control Module is mounted at the side of the Pneumatic Module in front of the basic actuator housing. Inside are terminals available for connecting ASI wiring. Two cable entries are available for this purpose.

Features

- **ASI** digital communication..
- **Supports both single and double acting actuators.**
- **One entry for all wiring** (control and feedback).
- **IPT-technology** (Intelligent Position Tracking).
- Up to **62 devices per segment** for ASI-2 protocol
- **IPT-technology** (Intelligent Position Tracking).
- **Automatic initialization** for easy setup of the actuator. **Pressing 4 seconds** simultaneously the “Open” and “Closed” reassignment buttons starts auto-initialization procedure and sets automatically the feedback limit switches.
- **Readjustable or Reversible position feedback** using the reassignment buttons.
- **Three indication LED’s** for “Status”, “Open” and “Closed” position. Status LED indicates:
  - Initialization procedure running (blinking)
  - Successful initialization procedure (LED is on)
  - No or failed initialization (flashing)
- Control Module **is easily plugged in** the Pneumatic Module.
- Modular functionality for **easy update** towards present and future bus systems.
- **The power supply and all inputs and outputs are galvanic isolated** which offers greater flexibility for systems connection.

FieldQ Button board





General specifications

Material housing	: Aluminium alloy
Electrical connections	: Internal terminal strip
	: Optional 4-pole quick connector M12x1
Cable entries	: 2x M20x1.5 or 2x 1/2”NPT
Enclosure	: IP65 / NEMA 4X
Finish	: Polyester non-TGIC based powder coating.
Operating media	: Air or inert gasses, filtered at 50 micron.
Temperature	: -20° to +80°C / -4° to +176°F
Dimensions	: See 1.603.01 metric
	See 1.603.04 imperial/UNC
	See 1.603.02 DIN 3337

Communication Protocol:

Protocol	: AS-Interface
Number of devices	: 31 for ASI-1 protocol
	: 62 for ASI-2 protocol
Current Minimum	: 30 mA (pilot valve off)
Maximum	: 127 mA (at 26.5V and 25°C and pilot valve on)
Protection	: 250mA from AS-Interface, by an internal automatic, resetable fuse.
ASI-Profile V3.0	: S-6.A.E (other profiles optional)

Factory settings:

Factory address	: 00	EID1	: 7
IO code	: 6	EID2	: E
ID code	: A	Parameter	: 00

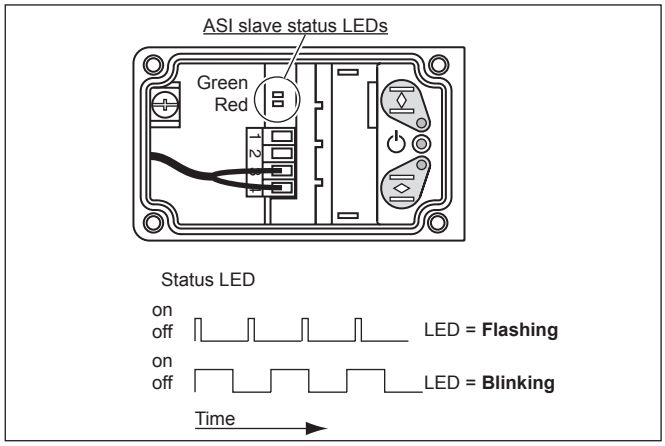
FieldQ data bits		Functions	
	Type	DI’s	DO’s
D0	Input	Feedback “Closed”	-/-
D1	Bi-directional	Feedback “Open”	Solenoid Control
D2	Bi-directional	Not used	
D3	Bi-directional	Not used	

Smart - Control Modules

QC30: AS-Interface

ASI status feedback

Status feedback is provided according to the ASI standard
For more detailed information on button board functionality and LED indications, see Installation Guide : DOC.IG.QC30.1



ASI terminal wiring connections:

Detailed Non-Incendive / Non-sparking wiring instructions, will be shipped with the product, see control drawing: see Installation Guide : DOC.IG.QC30.1

Wiring dimensions

Cable range : 0.14 - 1.5mm2 or 28-16 AWG

Quick connector:

- The ASI Module can optionally be equipped with prewired quick connectors. Two versions are available: 7/8" or M12 (male chassis part)
- Quick connectors, as shown below, are excluded for non-Incendive or non-sparking use in hazardous area's classified as Zone 2 or 22 or Cl I, II, III, Div. 2.

Options

Manual Control

- Can be added as kit or factory option in 2 versions, "Push button" or a "Push and lock" button.

Glands and plugs

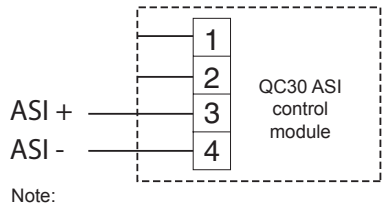
- FieldQ Control Modules can be shipped with plastic or metal glands (M20x1.5 or 1/2"NPT) and rated IP65 or higher.

Hazardous area executions:

- The ASI Control Module QC30 is available with optional Non-Incendive or Non-Sparking approvals as listed below:
  - **IECEx** : Ex nA II T4
    : Ex tD A22 T90° / IP65
    : Certificate : KEM 07.0046x
  - **ATEX** : Ⓔx II 3 G Ex nA II T4
    : Ⓔx II 3 D Ex tD A22 T90° / IP65
    : Certificate : KEMA 02ATEX1258X
  - **FM** : Non-Incendive, Class I, II, III, Div.2, Groups ABCDFG, T4, Type 4X/IP65
    : Class I, Zone 2, IIC T4
  - **CSA** : Non Incendive: Class I, II, III, Div.2, Groups ABCDFG, T4
    : Ex nA II T4 (Class I, Zone 2)
    : Certificate: 1477696

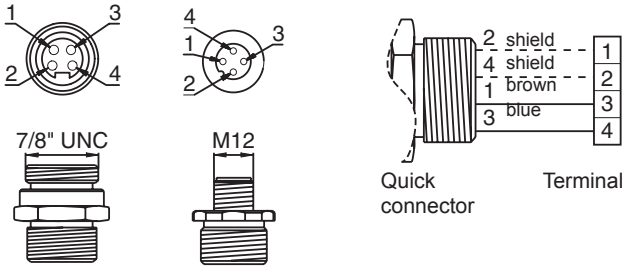
Ambient temperature:
T4 @ Ta = : -20°C…+75°C (-4°F…167°F)

ASI terminal wiring connections:



Note:
Terminal 1 and 2 may be used for shield.

Quick connector pinouts:
(male chassis part)



Smart - Control Modules

QC31: DeviceNet

Description:

This FieldQ Control Module offers an integrated concept for valve automation. Its compact and robust construction incorporates basic control and feedback functionality and communicates through the DeviceNet™ protocol.

Construction

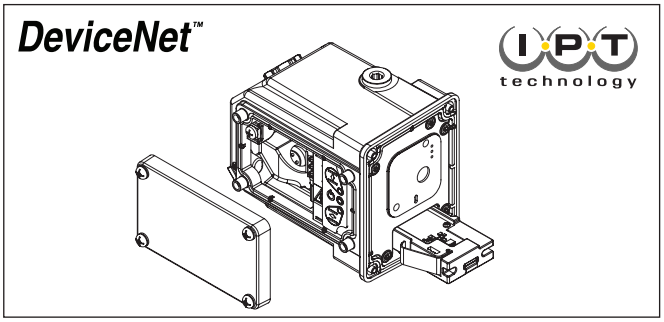
The Control Module is mounted at the side of the Pneumatic Module in front of the basic actuator housing. Inside are terminals available for connecting DeviceNet™ wiring. Two cable entries are available for this purpose.

Features

- ODVA **DeviceNet™** digital communication.
- **Supports both single and double acting actuators.**
- **One entry for all wiring** (control and feedback), using DeviceNet cabling.
- **IPT-technology** (Intelligent Position Tracking).
- **Automatic initialization** for easy setup of the actuator. **Pressing 4 seconds** simultaneously the “Open” and “Closed” reassignment buttons starts auto-initialization procedure and sets automatically the feedback limit switches.
- **Readjustable or Reversible position feedback** using the reassignment buttons.
- **Three indication LED’s** for “Status”, “Open” and “Closed” position. Status LED indicates:

Initialization procedure running	Blinking
Successful initialization procedure	LED is on
No or failed initialization	Flashing

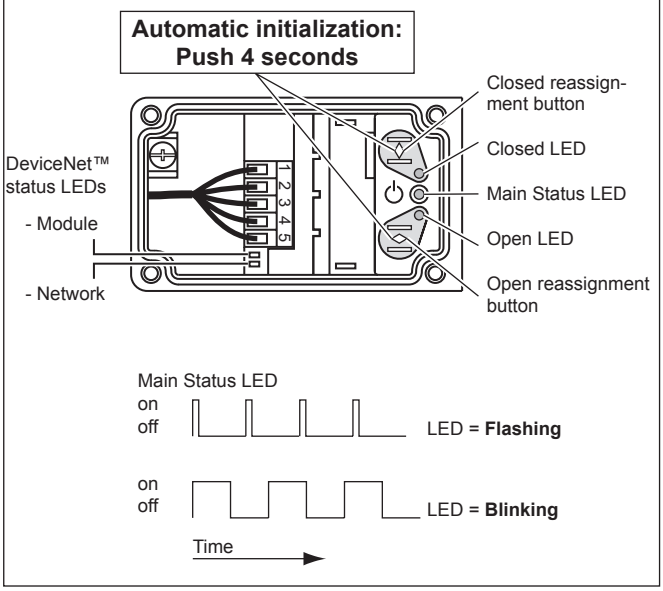
- Control Module **is easily plugged in** the Pneumatic Module.
- Modular functionality for **easy update** towards present and future bus systems.
- **The power supply and all inputs and outputs are galvanic isolated** which offers greater flexibility for systems connection.



General specifications

Material housing	: Aluminium alloy
Electrical connections	: Internal terminal strip
	: Optional quick connector
Cable entries	: 2x M20x1.5 or 2x 1/2”NPT
Enclosure	: IP65 / NEMA 4X
Finish	: Polyester non-TGIC based powder coating.
Operating media	: Air or inert gasses, filtered at 50 micron.
Temperature	: -20° to +80°C / -4° to +176°F
Dimensions	: See 1.603.01 metric
	See 1.603.04 imperial/UNC
	See 1.603.02 DIN 3337

FieldQ Button board and wiring compartment



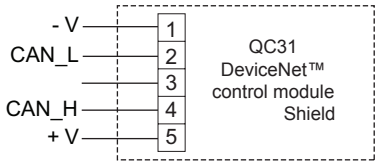
Communication Protocol:

General purpose discrete I/O, Class 7 with objects

Table 1: Protocol details and specifications

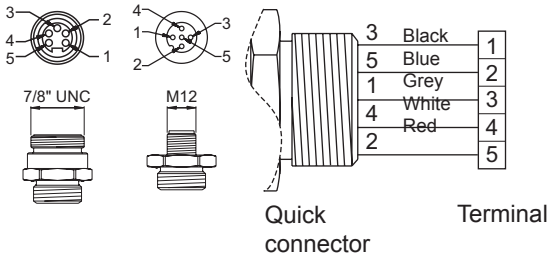
Common and DeviceNet specific Objects	Class ID	Instance ID(s)
Identity Object	1	1
Message Router Object	2	1
DeviceNet Object	3	1
Assembly Object	4	100, 101
Connection Object	5	1, 2, 4, 5, 6, 7
Discrete Input Point Object	8	100, 101
Discrete Output Point Object	9	100
Analog Input Point Object	10	100
Controller Object	100	1
Monitor Object	101	1
Device Conformance	ODVA DeviceNet Spec Vol.I Rev 3.7 & Vol. III Rev 1.8	
Communications	Prefined Master/Slave Connection Set, Group 2 Server.	
I/O Protocols	Polled I/O, Change of State (COS), Cyclic, Explicit and Dynamic Explicit connection objects.	
Baud Rate	Default set to "Auto-baud Can be set to 125, 250 or 500kb/sec	
Refresh rate	400 ms (2.5 kHz) minimum	
DeviceNet Connection	5 pole terminal, or quick connector	
Voltage isolation	None	
Nominal Power	120mA @ 11VDC 75mA @ 25VDC	
Maximum Power	2.0 W	

DeviceNet™ terminal wiring connections:



Quick connector pinouts:

(male chassis part)



Options

Manual Control

- Can be added as kit or factory option in 2 versions, “Push button” or a “Push and lock” button.

Glands and plugs

- FieldQ Control Modules can be shipped with plastic or metal glands (M20x1.5 or 1/2”NPT) and rated IP65 or higher.

Hazardous area executions:

- The DeviceNet™ Control Module QC31 is available with optional Non-Incendive or Non-Sparking approvals as listed below:
  - FM : Non-Incendive, Class I, II, III, Div.2, Groups ABCDEFG, T4, Type 4X/IP65
    : Class I, Zone 2, IIC T4
    : Certificate : 3017626
  - CSA : Non Incendive: Class I, II, III, Div.2, Groups ABCDEFG, T4
    : Ex nA II T4 (Class I, Zone 2)
    : DIP A22 TA 90°C
    : Certificate : 1477696

Ambient temperature:
T4 @ Ta = : -20°C…+80°C (-4°F…176°F)

DeviceNet™ terminal wiring connections:

Detailed Non-Incendive / Non-sparking wiring instructions, will be shipped with the product, see control drawing: see Installation Guide : DOC.IG.QC31.1

Wiring dimensions

Cable range : 0.2 - 2.5mm2 or 30-12 AWG

Quick connector:

- The DeviceNet™ Module can optionally be equipped with prewired quick connectors. Two versions are available: 7/8” or M12 (male chassis part)
- Quick connectors, as shown below, are excluded for non-Incendive or non-sparking use in hazardous area’s classified as Zone 2 or 22 or Cl I, II, III, Div. 2.

DeviceNet™ status LEDs

Status feedback is provided according to the DeviceNet™ standard. For more detailed information on button board functionality and LED indications, see Installation Guide : DOC.IG.QC31.1

Diagnostics on QC31 DeviceNet™ Control module

The FieldQ Control Module with DeviceNet™ communication has diagnostic capabilities. These process parameters can give information about communication condition, valve and/or actuator unit. It enables to predict failures in advance and makes maintenance easier to schedule.

Monitor Object

The QC31 DeviceNet™ Control module presents its diagnostics through the Instance Attributes of the Monitor Object, Class ID 101 (65_{hex}) as shown in table 2 and 3.

Table 2: Monitor Object Instance Attributes

Attribute ID	Name
1	Device Status
2	Zero power condition: 1 = Open, 0 = Close
3	Recognize unit status
4	Position
5	Time in position
6	Open travel timer
7	Close travel timer
8	Cycle counter
9	Average Open travel timer
10	Average Close travel timer
11	Selected FieldQ command to open and close

Table 3: Device Status Attributes

Bit	Description
0	Internal communications lost (set by DeviceNet firmware)
1	GMR_error
2	Temp_sensor_error
3	System_temp_exceeded
4	Software_error
5	travel_deviation
6	Shutdown_set
7	Unknown error
8	Init_bad_repeatability
9	Init_running
10	Init_stopped
11	Init_range_error
12	Init_timed_out
13	n/a
14	Init_ok
15	Init_default

Integrated Base Control Module

QC11, QC12 and QC13 (IP65/NEMA4X & NI/Ex nA)

Description:

These variations of the FieldQ conventionally wired control modules offer an integrated concept for valve automation. Its compact and robust construction incorporates basic control and feedback functionality. The modules are available as weather proof (IP65/NEMA4X) or Non-Incendive/Non-Sparking for use in hazardous area's classified as Zone 2 or 22 or Class I, II, III, Division 2.

Construction:

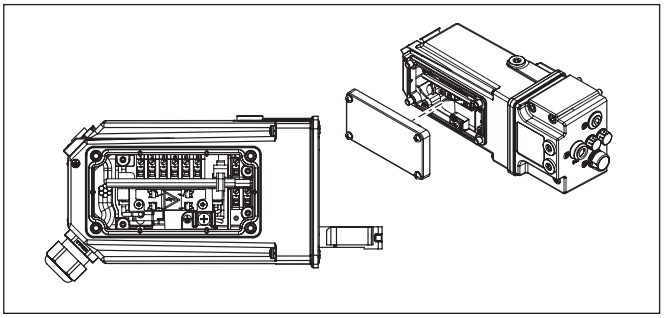
The Control Module is mounted at the side of the Pneumatic Module in front of the basic actuator housing. Inside, wiring terminals are available for connecting control signal to the pilot valve and feedback signals to the switches. Three cable entries are available.

Features:

- Basic actuator functions for fail safe (spring return) or double acting applications.
- Robust IP65/NEMA4X enclosure, protecting the IPT system, the pilot valve's coil, the feedback switches and terminals, suitable for indoor and outdoor use.
- All the control and feedback connections can be wired to the Control Module.
- IPT-technology.
- Easy to set feedback signals.
- Control module can be easily plugged in the pneumatic module.
- IECEx, ATEX, FM and CSA Non-Incendive or Non Sparking approvals.

General specifications:

Material housing	: Aluminium alloy
Electrical connections	: Internal 9 pole terminal strip.
Cable entries	: 3x M20x1.5 or 3x 1/2"NPT
Operating media	: Air or inert gasses, filtered at 50µm
Switch point	: Factory set at 15° maximum before each end of travel (open and closed position).
- Adjustable range	: Between -3° to 15° and +75° to +93° of the end position.
Enclosure	: IP65 / NEMA 4X
Finish	: Polyester non-TGIC based powder coating.
Temperature	: Depends on the applied switches and/or Hazardous Area approvals (See section Feedback switches QC11, QC12 & QC13)
Dimensions	: See 1.603.01 metric See 1.603.04 imperial/UNC See 1.603.02 DIN 3337



Pilot valve specifications

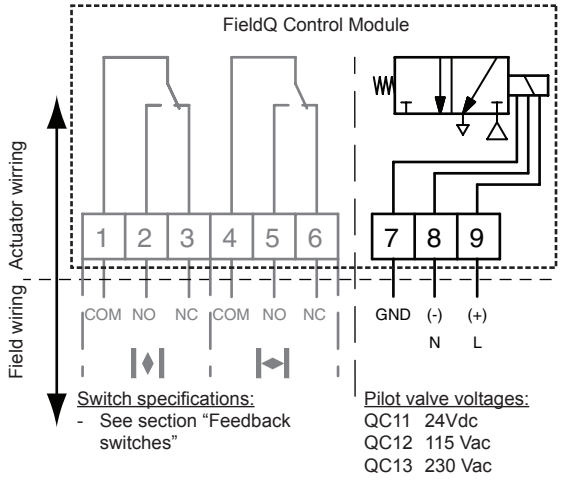
The pilot valve inside the Control Module sends the actuator to its open or closed position. The following pilot valves are available for the weather proof versions:

Module:	Voltages Un:	Power:
QC11	24VDC*	1.3W
QC12	115 VAC*	1.3VA
QC13	230 VAC*	1.9VA

* T ambient:		Un:
-20°C to +60°C	(-4°F to +140°F)	: +10% / -15%
+60°C to +80°C	(+140°F to +176°F)	: +0% / -10%

Wiring diagram:

- Pilot valves



Cable range : 0.2 - 2.5mm² or 30-12AWG

Feedback switches QC11, QC12 and QC13 Control Modules

The feedback switches inside the module senses the open or closed position and are prewired to the terminal strip. The following feedback switches are available:

Mechanical switches	
Option code	M
Option code	G (gold plated)
Type	Mechanical V4
Voltage	M: 250 VAC or 250VDC (maximum)
	G: 125 VAC or 30VDC (maximum)
Contacts	NO and NC
Mechanical life	10^7 operations (depends on electrical load).
Temperature	-20°C to +80°C (-4°F to +176°F)

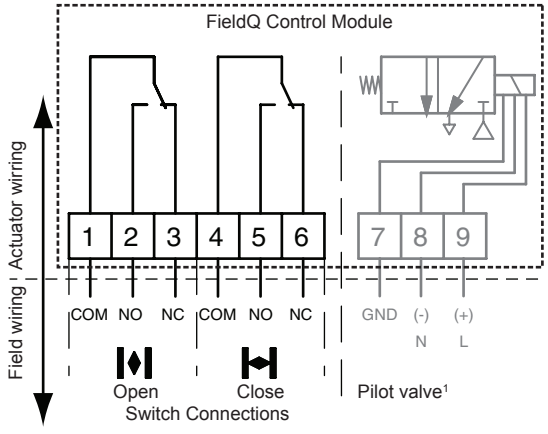
Maximum currents:		
Load :	**Non Inductive**	**Inductive**
125 VAC	5 A (100 mA)[1]	3 A
250 VAC	3 A	2 A
30 VDC	4 A (100 mA)[1]	3 A
125 VDC	0.4 A	0.4 A
250 VDC	0.2 A	0.2 A

1 Values in parentheses are for the “G” type switch

Hermetically sealed switches	
Option code	D
Type	Hermetically sealed V3
Voltage	250 VAC or 250VDC (maximum)
Contacts	Gold plated, NO and NC
Mechanical life	10^7 operations (depends on electrical load).
Temperature	-20°C to +80°C (-4°F to +176°F)

Maximum currents:		
Load :	**Non Inductive**	**Inductive**
125 VAC	5 A	5 A (Cos φ ≥ 0.9)
250 VAC	5 A	5 A (Cos φ ≥ 0.9)
30 VDC	5 A	5 A
125 VDC	0.5 A	0.06 A
250 VDC	0.25 A	0.03 A

Wiring diagram:
- Mechanical switches
- Hermetically sealed switches



Cable range : 0.2 - 2.5mm² or 30-12AWG
1 See secton “Pilot valve specifications”
2 For Non-Incendive (Cl. I Div2) or Non-Sparking (Zone 2) hazardous area applications, see Installation Guide : DOC.IG.QC11.1
3 Wiring diagram is shown in the actuators mid-stroke position.

Important

The mechanical (G-type) and hermetically sealed (D-type) switches have gold contacts. For applications where the benefits of gold contacts are required, the maximum current is 100mA. When the current is higher than 100mA, the gold plating will evaporate.

Hazardous area executions:

The Conventional Modules QC11, QC12 and QC13, with the Hermetically sealed switches, are available with IECEx, ATEX, FM and CSA Non-Incendive or Enclosed Break approvals for use in Zone 2 or 22 or Class 1 Div. 2 and for all gas and dust groups.

ATEX CE

Ex II 3 G Ex d nA II T4/T5
Ex II 3 D Ex tD A22 T90°C IP65
Certificate:TÜV 07 ATEX 553926X

FM APPROVED
N.I. Cl I, DIV2, GPS A,B,C,D
S CL II, III, DIV2, GPS E,F,G, Type 4X
Temp Class T4/T5, Class I, Zone 2, IIC
FM Approval 3031376

Class I,II,III, Div.2,
Groups ABCDEFG, T4/T5, Type 4X
Ex d nA IIC, T4/T5, IP65
DIP A22 TA 90°C
Certificate: 1638508

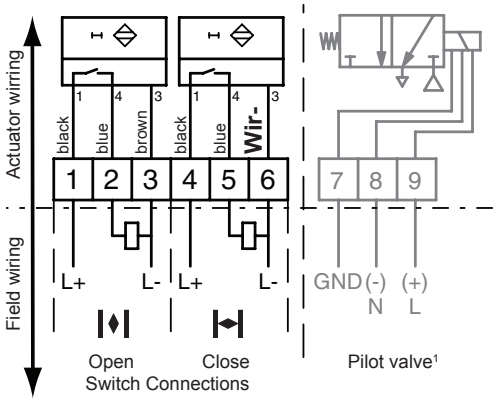
Temperature range:
T4 @ Ta = -20°C(-4°F) to 80°C (176°F)
T5 @ Ta = -20°C(-4°F) to 45°C (113°F)

Feedback switches QC11, QC12 and QC13 Control Modules

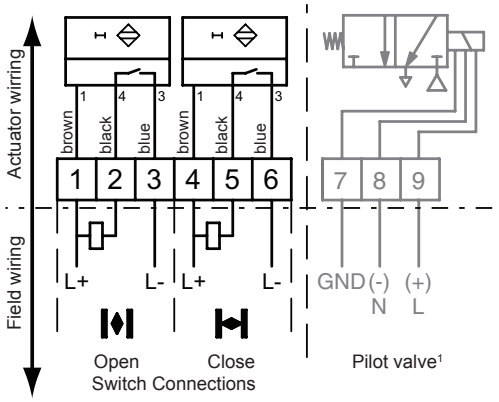
The feedback switches inside the module senses the open or closed position and are prewired to the terminal strip. The following feedback switches are available:

3-Wire proximity switches	
Option code	O, V3 PNP
Option code	C, V3 NPN
Function	Make
Voltage	10 - 30V
Current	100 mA maximum
Off-state current	0 ... 0.5 mA typical
Temperature	-20°C to +70°C (-4°F to +158°F)

Wiring diagram:
3-Wire proximity switches PNP



Wiring diagram:
3-Wire proximity switches NPN



Cable range : 0.2 - 2.5mm² or 30-12AWG
1 See secton “Pilot valve specifications”
2 For Non-Incendive (Cl. I Div2) or Non-Sparking (Zone 2) hazardous area applications, see Installation Guide : DOC.IG.QC11.1
3 Wiring diagram is shown in the actuators mid-stroke position.

brown

Feedback switches QC11, QC12 and QC13 Control Modules

The feedback switches inside the module senses the open or closed position and are prewired to the terminal strip. The following feedback switches are available:

2-Wire NAMUR proximity switches	
Option code	N
Type	2-wire inductive
Voltage	8 VDC nominal
Ouput	Unswitched , > 3mA
	Switched , < 1mA
Temperature	-20°C to +80°C (-4°F to +176°F)
Compliant to	DIN EN 60947-5-6 (NAMUR)

Hazardous area executions:

The Conventional Modules QC11, QC12 and QC13 in combination with the 2-Wire NAMUR proximity switches have IECEx, ATEX, FM and CSA Non-Incendive or Non Sparking approvals for use in Zone 2 or 22 or Class 1 Div. 2 and for all gas and dust groups.

ATEX CE
Ex II 3 G Ex nA II T4/T5
Ex II 3 D Ex tD A22 T90°C IP65
Certificate: TÜV 07 ATEX 553926X

FM APPROVED
N.I. CL I, DIV2, GPS A,B,C,D
S CL II,III, DIV2, GPS E,F,G, Type 4X
Temp Class T4/T5; Class I, Zone 2, IIC
FM Approval : 3031376

Class I,II,III, Div.2,
Groups ABCDEFG, T4/T5, Type 4X
Ex nA II T4/T5, IP65,
DIP A22 TA 90°C
Certificate: 1638508

Temperature range:
T4 @ Ta = -20°C(-4°F) to 80°C (176°F)
T5 @ Ta = -20°C(-4°F) to 45°C (113°F)

2-Wire 115V proximity switches		
Option code	H	
Voltage	20...140 Vac / 10...140 Vdc (47...63 Hz AC)	
Current	Continuous	200 mA,
	Peak	0,9A (20ms / 0,5Hz),
Leakage current	< 0,8 mA	
Temperature	-20°C to +80°C (-4°F to +176°F)	

Hazardous area executions:

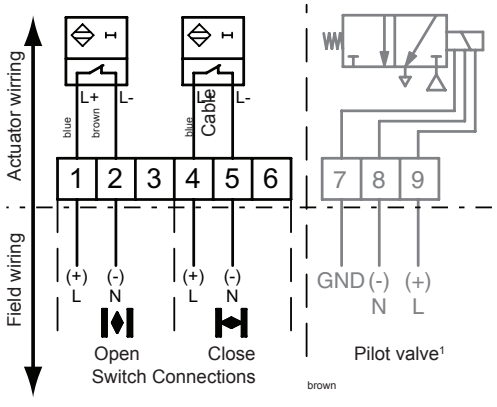
The Conventional Modules QC11, QC12 and QC13 in combination with the 2-Wire 115V proximity switches have FM and CSA Non-Incendive approvals for use in Class 1, Div. 2 and for all gas and dust groups.

FM APPROVED
N.I. CL I, DIV2, GPS A,B,C,D
S CL II,III, DIV2, GPS E,F,G, Type 4X
Temp Class T4/T5; Class I, Zone 2, IIC
FM Approval : 3031376

Class I,II,III, Div.2,
Groups ABCDEFG, T4/T5, Type 4X
Ex nA II T4/T5, IP65,
DIP A22 TA 90°C
Certificate: 1638508

Temperature range:
T4 @ Ta = -20°C(-4°F) to 80°C (176°F)
T5 @ Ta = -20°C(-4°F) to 45°C (113°F)

Wiring diagram:
2-Wire NAMUR proximity switches
2-Wire 115V proximity switches



range : 0.2 - 2.5mm² or 30-12AWG
1 See secton “Pilot valve specifications”.
2 For Non-Incendive (Cl. I Div2) or Non-Sparking (Zone 2) hazardous area applications, see Installation Guide : DOC.IG.QC11.1
3 Wiring diagram is shown in the actuators mid-stroke position.

Integrated Base Control Module

QC14 Intrinsic Safe

Description:

The Intrinsic Safe FieldQ conventionally wired control modules offer an integrated concept for valve automation. Its compact and robust construction incorporates basic control and feedback functionality.

Construction:

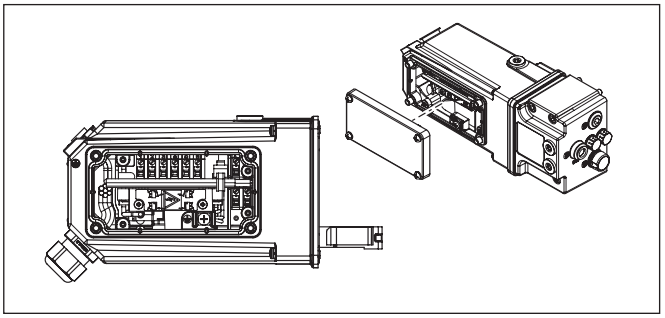
The Control Module is mounted at the side of the Pneumatic Module in front of the basic actuator housing. Inside, wiring terminals are available for connecting control signal to the pilot valve and feedback signals to the switches. Three cable entries are available.

Features:

- Basic actuator functions for fail safe (spring return) or double acting applications.
- Robust IP65/NEMA4X enclosure, protecting the IPT system, the pilot valve's coil, the feedback switches and terminals, suitable for indoor and outdoor use.
- All the control and feedback connections can be wired to the Control Module.
- IPT-technology.
- Easy to set feedback signals.
- Control module can be easily plugged in the pneumatic module.
- ATEX and CSA Intrinsically Safe approvals.

General specifications:

Material housing	: Aluminium alloy
Electrical connections	: Internal 9 pole terminal strip.
Cable entries	: 3x M20x1.5 or 3x 1/2"NPT
Operating media	: Air or inert gasses, filtered at 5µm
Switch point	: Factory set at 15° before each end of travel (open and closed position).
- Adjustable range	: Between -3° to 15° and +75° to +93° of the end position.
Enclosure	: IP65 / NEMA 4X
Finish	: Polyester non-TGIC based powder coating.
Temperature	: -20°C ... +50°C (-4°F ... +122°F)
Dimensions	: See 1.603.01 metric See 1.603.04 imperial/UNC See 1.603.02 DIN 3337



Pilot valve specifications

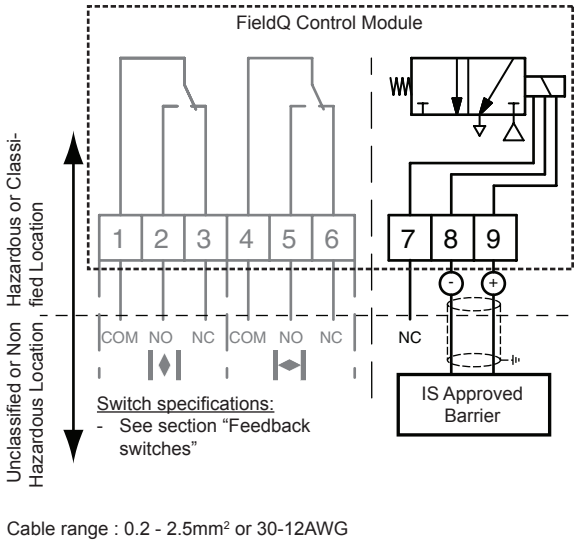
The pilot valve inside the Control Module sends the actuator to its open or closed position.

Typical functional ratings Pilot Valves			
Voltage	Turn on	V	21.6 ... 28
	Turn off	V	5
Current	Peak	mA	10
	Hold	mA	1.9
Resistance	Barrier+Cable	Ohm	1200

Safety parameters Pilot Valves			
Voltage	Ui	V	30
Maximum	Li	mA	200
Power	Pi	W	0.9
Capacity maximum	Ci	nF	0
Inductivity	Li	mH	0

Wiring diagram:

- Pilot valves



Cable range : 0.2 - 2.5mm² or 30-12AWG

Feedback switches QC14 Intrinsically Safe Control Module

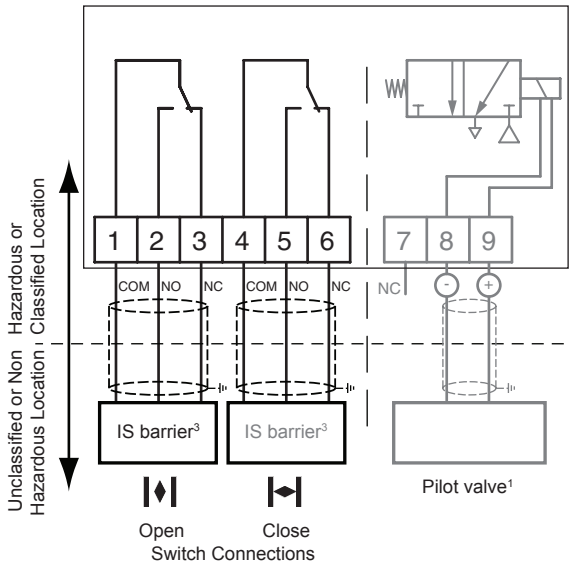
The feedback switches inside the module senses the open or closed position and are prewired to the terminal strip. The following feedback switches are available:

Mechanical switches	
Option code	M or G
Type	Mechanical V4
Contacts	NO and NC (G = Goldplated)
Mechanical life	10^7 operations (depends on electrical load).
Temperature	-20°C to +50°C (-4°F to +122°F)

Hermetically sealed switches	
Option code	D
Type	Hermetically sealed V3
Contacts	Gold plated, NO and NC
Mechanical life	10^7 operations (depends on electrical load).
Temperature	-20°C to +50°C (-4°F to +122°F)

Wiring diagram:

- Mechanical switches
- Hermetically sealed switches



Cable range : 0.2 - 2.5mm² or 30-12AWG

1 See secton “Pilot valve specifications”
2 For Intrinsically Safe (Cl. I Div1 or Zone 1 or 21) hazardous area applications, see Installation Guide : DOC.IG.QC14.1
3 IS Approved barrier
4 Wiring diagram is shown in the actuators mid-stroke position.

IS barrier3

Hazardous area executions:

The Conventional Modules QC14 in combination with the mechanical gold plated and hermetically sealed switches, have an ATEX and CSA Intrinsically Safe approval as listed below:

ATEX CE 0344
: Ex II 1 G Ex ia IIC T4...T6, Ex II 1 D Ex tD A20 T80°C
Optional for D type switch: Ex II 1 G Ex ib d IIC T4...T6
: Certificate : TÜV 07 ATEX 553928X

: Intrinsically safe, Class I, II, III, Division 1, Groups ABCDEFG T4...T6, Type 4X
: Ex ia IIC, T6, IP65
: DIP A20 TA 80°C
: Certificate : 1638508

Temperature range:

T4..T6 @ Ta = -20°C(-4°F) to +50°C (122°F)

QC14 Intrinsically Safe Entity Parameters Feedback switches						
Circuit	**Terminal**	**Ui**	**Ii**	**Pi**	**Ci**	**Li**
M-type, D type	1 - 2 - 3, 4 - 5 - 6	30Vdc	300mA	1.2W	0	0
G-type	1 - 2 - 3, 4 - 5 - 6	30Vdc	100mA	1.2W	0	0

ATEX classified hazardous areas:

Base FieldQ actuators do not comply to all Zone 0 requirement. Please contact our sales for these Zone 0 appplications.

The combination of basic actuator and the above control module QC14 is allowed to be used up to Zone 1 or 21.

Feedback switches QC14 Intrinsically Safe Control Module

The feedback switches inside the module senses the open or closed position and are prewired to the terminal strip. The following feedback switches are available:

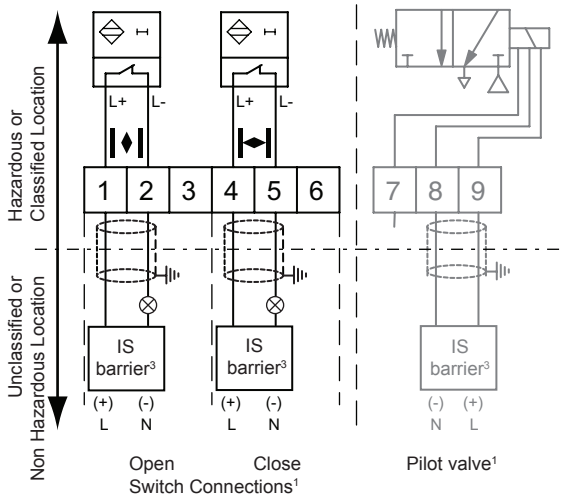
2-Wire NAMUR proximity switches	
Option code	N
Type	2-wire inductive, normally closed
Voltage	8 VDC nominal
Ouput	Unswitched , > 3mA
	Switched , < 1mA
Temperature	-20°C to T* (-4°F to +T*)
Compliant to	DIN EN 60947-5-6 (NAMUR)

QC14 Intrinsically Safe Entity Parameters Feedback switches						
Circuit	**Terminal**	**Ui**	**Ii**	**Pi**	**Ci**	**Li**
Type 1	1 – 2, 4 - 5	16Vdc	25mA	34mW	100nF	100µH
Type 2	1 – 2, 4 - 5	16Vdc	25mA	64mW	100nF	100µH
Type 3	1 – 2, 4 - 5	16Vdc	52mA	169mW	100nF	100µH
Type 4	1 – 2, 4 - 5	16Vdc	76mA	242mW	100nF	100µH

* a cable length of 10 m is considered.

Wiring diagram:

2-Wire NAMUR proximity switches



Cable range : 0.2 - 2.5mm² or 30-12AWG
1 See secton "Pilot valve specifications"
2 For Intrinsically Safe (Cl. I Div1 or Zone 1 or 21) hazardous area applications, see Installation Guide : DOC.IG.QC14.1
3 IS Approved barrier
4 Wiring diagram is shown in the actuators mid-stroke position.

Hazardous area executions:

The Conventional Modules QC14 in combination with the NAMUR proximity switches, have an ATEX and CSA Intrinsically Safe approval as listed below:

ATEX : CE 0344
: Ex II 1 G Ex iaT*
Ex II 1 G Ex tD A20 T80°C IP65
: Certificate : TÜV 07 ATEX 553928X

: Intrinsically safe, Class I, II, III, Division 1, Groups ABCDEFG T*, Type 4X
: Ex ia IIC, T*, IP65
: DIP A20 TA 80°C
: Certificate : 1638508

Temperature range:
T4...T6 @ Ta = -20°C(-4°F) to +50°C (122°F)

T* ambient at T class:			
Connection	**T6**	**T5**	**T4 – T1**
Type 1	50°C / 122°F	50°C / 122°F	50°C / 122°F
Type 2	46°C / 114°F	50°C / 122°F	50°C / 122°F
Type 3	25°C / 77°F	37°C / 98°F	50°C / 122°F
Type 4	10°C / 50°F	22°C / 71°F	50°C / 122°F

ATEX classified hazardous areas:

Base FieldQ actuators do not comply to all Zone 0 requirement. Please contact our sales for these Zone 0 appplications.

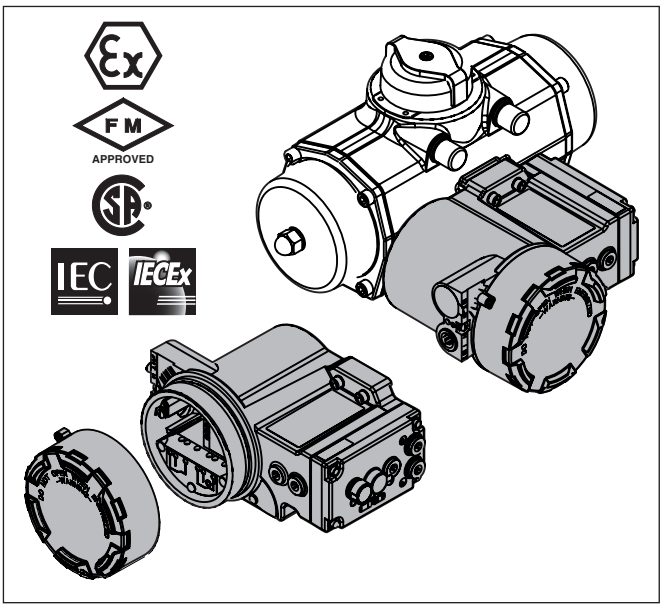
The combination of basic actuator and the above control module QC14 is allowed to be used up to Zone 1 or 21.

Integrated Control modules

QC41, QC42 and QC43

Features:

- **Basic actuator functions for:**
  - Spring return applications, or
  - Double acting applications or,
  - Double acting Fail in Last Position applications.
- **Suitable for all FieldQ actuator sizes.**
- **Available as "Weather Proof" for indoors or outdoors use and "Explosion Proof" for areas with a potential explosion hazard.**
  - The robust aluminum alloy enclosure (IP66 / NEMA4X rated), protects the IPT system, pneumatic components, the feedback switches and terminals and makes it suitable for indoor and outdoor use.
  - The Explosion Proof version is available with ATEX / IECEx Ex d approval for use in Zone 1, 2, 21 and 22 and/or FM / CSA Explosion proof approval for use in Class I, Division 1.
- **Various feedback switch options available.**
- **Non-Intrusive switch point adjustment of the feedback switches. Allows to adjust switch points without opening the Control Module.**
- **Lockable Control Module cover.**
- **All the control and feedback connections can be wired through one single entry to the Control Module.**
- **One larger entry (3/4"NPT) is available for larger multi-core cables on imperial units.**



Description:

These FieldQ conventionally wired control modules are the next step for the integrated concept of valve automation. Next to the components for feedback switches, also all the pneumatic control components are located inside one module housing.
Its compact and robust construction incorporates basic control and feedback functionality and is suitable for indoor and outdoor use.
These modules are available with ATEX and IECEx certification for use in Zone 1, 2, 21 and 22, and additionally FM and CSA certified for use in Class I, Division 1.

Construction:

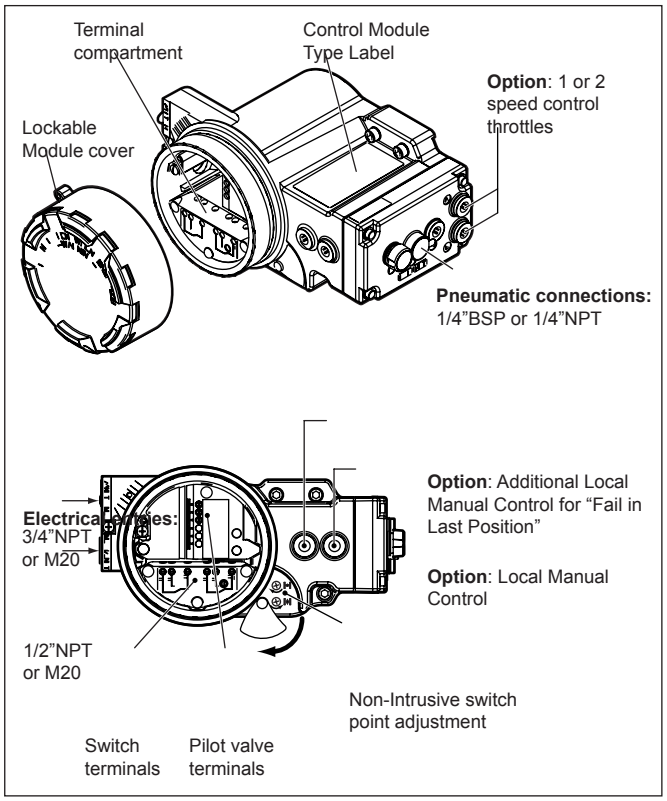
The Control Module is mounted at the side of the basic actuator housing. Inside, wiring terminals are available for connecting control and feedback signals. Two cable entries are available.
The pilot valves inside the control module are used to send the actuator to its open or closed position. One pneumatic connection is available to feed the control module.

General specifications:

Material housing:	Aluminium alloy
Operating media:	Air or inert gasses, filtered at 50µm
Pneumatic entry:	Metric units: G1/4"
	Imperial units: 1/4”NPT
Electrical connections:	Pilot valve(s): 6 pole terminal strip.
	Switches: 6 pole terminal strip.
Cable entries:	Metric units: 2x M20x1.5
	Imperial units: 1/2” and 3/4"NPT
Enclosure:	Rated IP66 - NEMA4X
Switch points:	Factory set at 15° before each end of travel (open and closed position).
- Adjustable range:	Between -3° to 15° and +75° to +93° of the end position.
Finish:	Chromated, polyurethane based coating.
Temperature range:	Depends on the switches inside the module and or Hazardous Area approvals (See section "Position feedback"
Dimensions:	Metric: 1.603.08
	Imperial/UNC: 1.603.09
	DIN 3337: 1.603.10

Electrical safety requirements:

Use	:	In- and outdoor.
Altitude	:	Operating full power available up to 2000 meter (6000 feet).
Maximum relative humidity	:	80% for temperatures up to 31°C (87.8°F) decreasing linearly to 50% relative humidity at 40°C (104°F).
Mains supply fluctuation	:	Up to ±10% of nominal voltage
Over voltage category	:	II
Pollution degree	:	2 (3 when the cover remains closed)



Control module overview

Pneumatic control

Pneumatic control variations

The Control Module contains all the necessary pneumatic components to control the actuator and control the incoming and outgoing airflow. Pneumatically the modules are available for three applications:

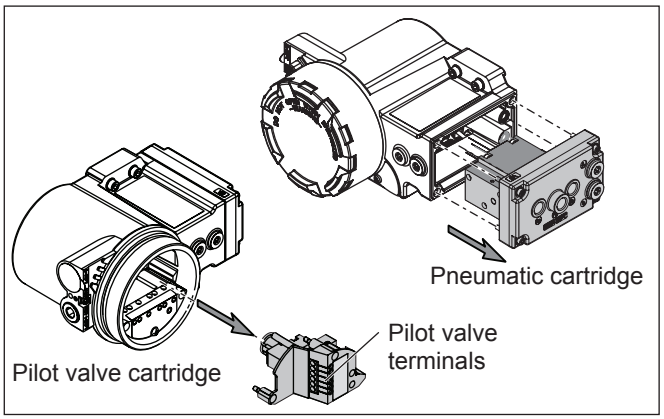
1 Spring return or
2 Double acting or
3 Double Acting - "Fail-in-Last-Position".

To achieve these functions, each Control Module can be fitted with one or two pilot valves depending on the required functionality:

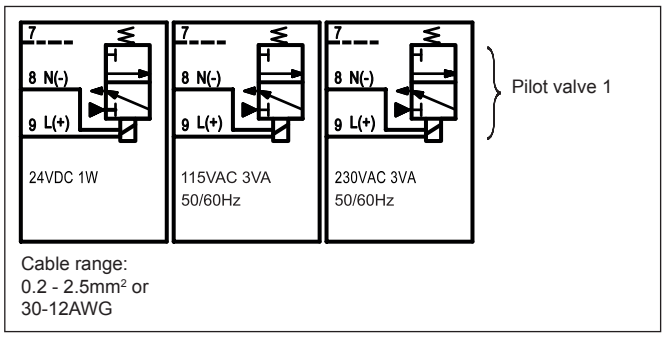
1 One pilot valve is default and suitable for normal operation of double acting or spring return actuators
2 Two pilot valves are required to achieve a "Fail-in-Last-Position" functionality on double acting actuators.

Table 1: Pilot valve specifications

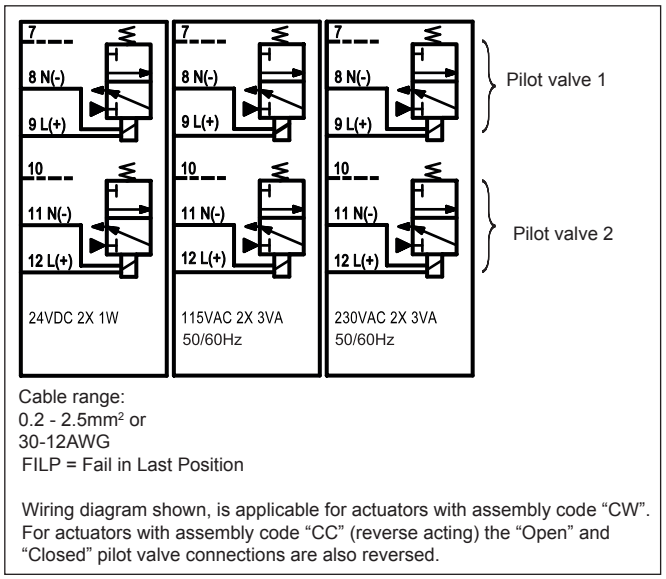
Module	Voltages	Power	Frequency
QC41	24VDC (±10%)	1W	NA
QC42	115 VAC (±10%)	3VA	50/60Hz
QC43	230 VAC (±10%)	3VA	50/60Hz



Pilot valve and pneumatic cartridge



One default pilot valve and wiring connections



Two pilot valves and wiring connections for Fail in Last Position

Pneumatic components

The pneumatic components inside the module consist out of one or two pilot valves and a 3/2 spool valve or 5/2 bistable spool valve. The spool valves are pneumatically operated by the pilot valves.
To assure trouble-free operation, the spool valves are equipped with big ports. This enables a large air flow and makes it less sensitive for contamination of the internals. The large air flow also fast cycle times and enables it to be utilized for the entire FieldQ actuator range.

Internal corrosion protection:

The spring return models have standard a built in “Breather” function. During the spring stroke, the exhaust air from the center chamber (A-Port) is first fed to the spring chamber (B-port) preventing air from outside from being sucked into the spring chamber. This reduces the possibility of internal corrosion and maximizes the actuators’ working life.

Pneumatic options

Speed Control

The FieldQ can be supplied with a Speed Control option. One throttle is required for Spring Return actuators and up to two for Double Acting actuators.
The speed control throttle controls the air flow in and out of an air chamber and as such limits the speed of the “Opening” and “Closing” stroke simultaneously.

Silencers and vents

The exhaust ports Ra and Rb on the module are shipped from the factory with transport protection.
The module can be equipped with either silencers or vents.

Manual Control

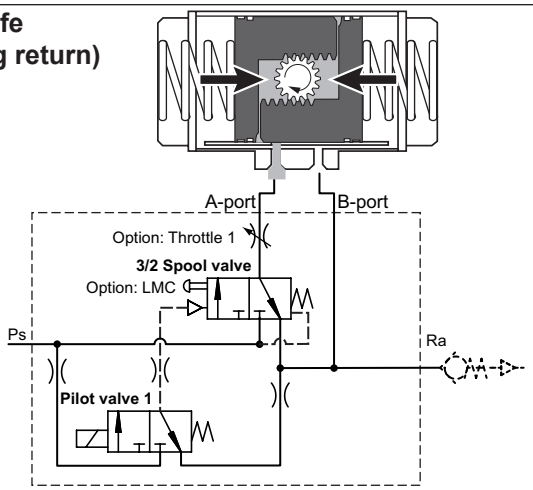
For commissioning, emergency or maintenance purposes, the FieldQ can be supplied with Manual Control options. These options can operate the actuator when there is air pressure available, but no control signal or power supply.

- For normal operation the module should be fitted with one Manual Control.
- For Double Acting with a Fail-in-Last-Position function, two Manual Control can be fitted.

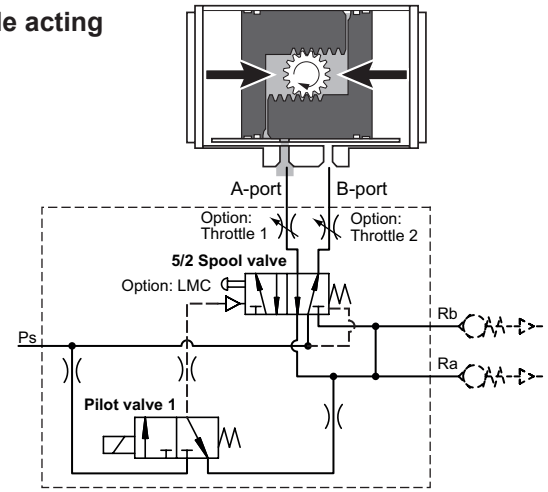
Maximum Flow rates of Q-Series modules

The maximum flow rates depends mainly on the flow rates of the FieldQ XP modules. You can use Kv 0.33 (m^3/h) or Cv value of 0.28 (US gall/min 1Psi) for approximate operating speed calculations.

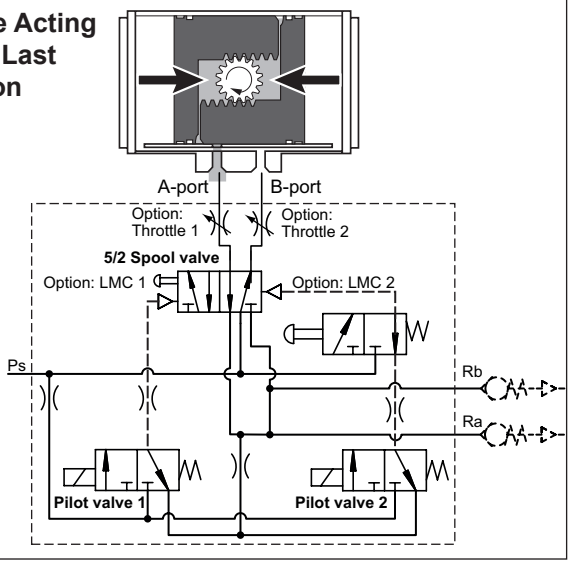
Fail safe (spring return)



Double acting



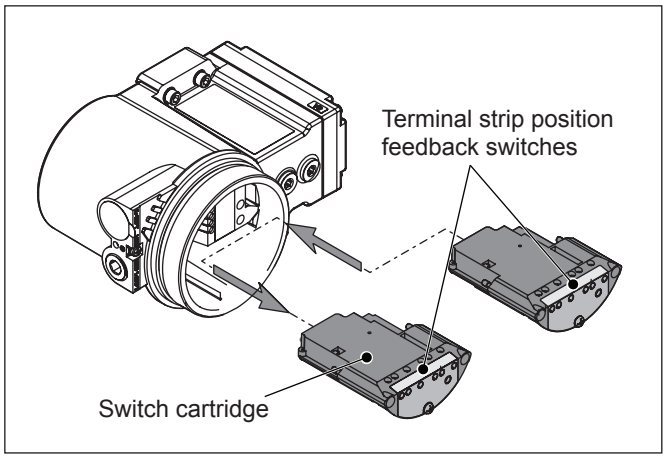
Double Acting Fail in Last Position



Position feedback

Switch cartridges

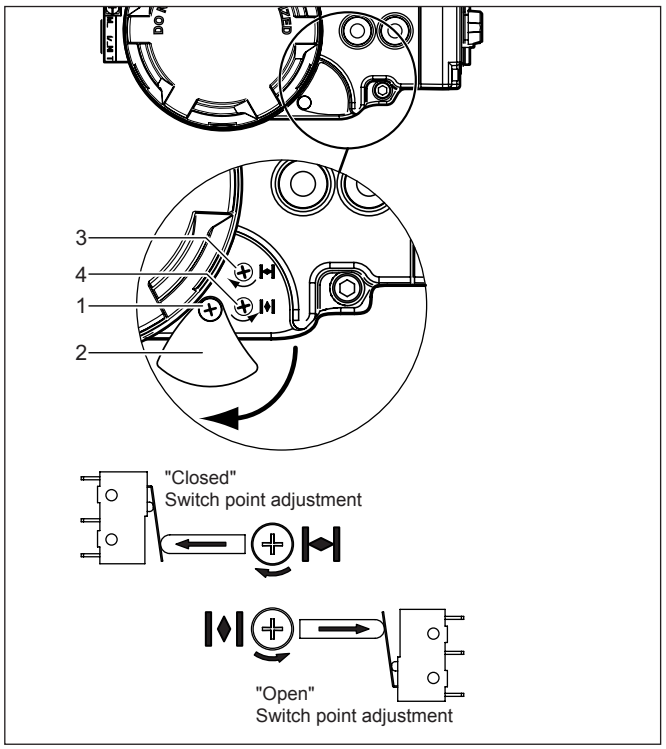
The position feedback is achieved by switch cartridges in the module. These cartridges contain switching elements which sense the open or closed position and are pre wired to the terminal strip. These easily exchangeable switch cartridges are available with various mechanical or proximity switching elements.



Switch cartridges

Non-Intrusive switch point adjustment

If required the switches can be adjusted without opening the module. This, so called, Non-Intrusive switch adjustment is located at the front of the module behind a locable (1) shield (2). Two adjustment screws are available for adjusting the Closed (3) and Open (4) position indication.



Non-Intrusive switch point adjustment

Important:

- The above "Closed" and "Open" marked adjustment screws will adjust the valve's "Closed" or "Open" switch point, if the valve closes after a Clock Wise (CW) rotation.
- If the valve closes after a Counter Clock Wise (CCW) rotation, the "Closed" marked adjustment screw will adjust the "Open" switch point. Similar, the "Open" marked adjustment screw will adjust the "Closed" switch point.

Mechanical switches

Table 2: Mechanical switches

Specification	Description
Option code	M
Option code	G (gold contacts)
Type	Mechanical
Voltage	M: 277 VAC or 250VDC (maximum)
	G: 125 VAC or 30VDC (maximum)
Contacts	NO and NC
Temperature range	-25°C to +65°C / -13°C to +149°F For use in hazardous areas, see table 7

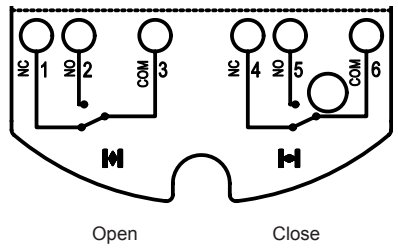
Table 3: Maximum currents

Switch voltage	M type switch	G type switch
125 VAC	10 A (3 A[1])	0.1 A [2]
250 VAC	10 A (3 A[1])	-
30 VDC	0.5 A	0.1 A [2]
125 VDC	0.5 A	-
250 VDC	0.25 A	-

Note:

1. The mechanical (M-type) switches are rated for 3 A with inductive load.
2 The mechanical (G-type) switches have gold contacts. For applications where the benefits of gold contacts are required, the maximum current is 1 A.
3. For applications below -20°C (-4°F), the base actuator must be equipped with Low temperature seals.

Wiring diagram:
- M = Mechanical
- G = Mechanical, gold contacts



Cable range : 0.2 - 2.5mm² or 30-12AWG
Wiring diagram is shown in the actuators mid-stroke position.

Wiring diagram for mechanical switches

2-Wire Proximity switches

Table 4: 2-wire NAMUR proximity switches

Specification	Description
Option code	N
Type	2-wire inductive, normally closed
Voltage	8 VDC nominal
Output	Unswitched , > 3 mA
	Switched , < 1 mA
Temperature range	-25°C to +65°C / -13°C to +149°F For use in hazardous areas, see table 7
Compliant to	DIN EN 60947-5-6 (NAMUR)

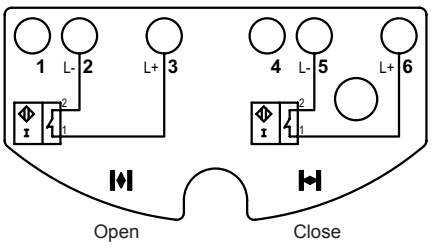
Table 5: 2-Wire 230V proximity switches

Specification	Description	
Option code	H	
Voltage	20...250VAC / 10...300VDC (50...60 Hz AC)	
Current	Maximum	100 mA
	Peak	0,9A (20ms / 0,5Hz),
Leakage	< 1.7 mA	
Temperature range	-25°C to +65°C / -13°C to +149°F For use in hazardous areas, see table 7	

Note:

1 For applications below -20°C (-4°F), the base actuator must be equipped with Low temperature seals.

Wiring diagram:
- 2-Wire NAMUR proximity switches
- 2-Wire 115V proximity switches



Cable range : 0.2 - 2.5mm² or 30-12AWG

Wiring diagram for 2-Wire proximity switches

Important:

- The above "Closed" and "Open" marked adjustment terminals will indicate the valve's "Closed" or "Open" switch point, if the valve closes after a Clock Wise (CW) rotation.
- If the valve closes after a Counter Clock Wise (CCW) rotation, the "Closed" marked adjustment terminals will indicate the "Open" switch point. Similar, the "Open" marked adjustment terminals will indicate the "Closed" switch point.

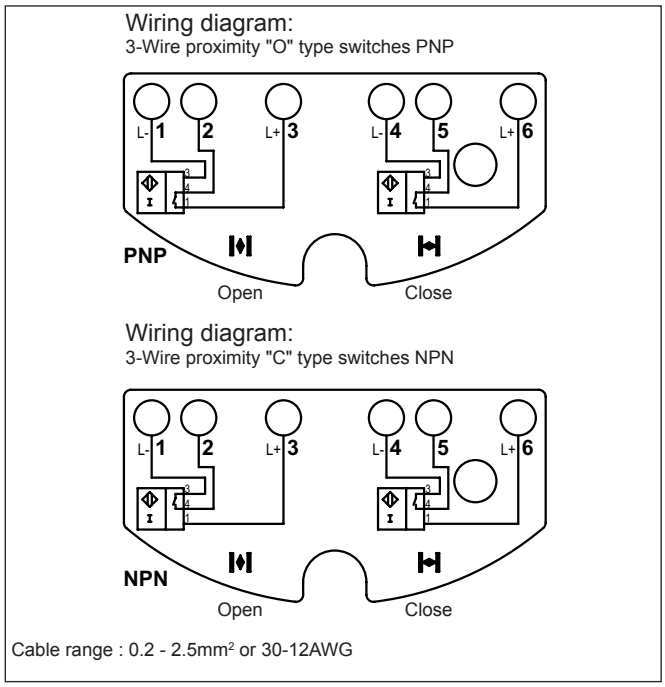
3-Wire Proximity switches

Table 4: 3-wire proximity switches

Specification	Description
Option code	O, V3 PNP
Option code	C, V3 NPN
Function	Make
Voltage	10 - 30V
Current	100 mA maximum
Off-state current	0 ... 0.5 mA typical
Temperature range	-25°C to +65°C / -13°C to +149°F For use in hazardous areas, see table 7

Note:

1 For applications below -20°C (-4°F), the base actuator must be equipped with Low temperature seals.



Wiring diagram for 3-Wire proximity switches

Important:

- The above "Closed" and "Open" marked adjustment terminals will indicate the valve's "Closed" or "Open" switch point, if the valve closes after a Clock Wise (CW) rotation.
- If the valve closes after a Counter Clock Wise (CCW) rotation, the "Closed" marked adjustment terminals will indicate the "Open" switch point. Similar, the "Open" marked adjustment terminals will indicate the "Closed" switch point.

Control Module Options

QC41, QC42 and QC43

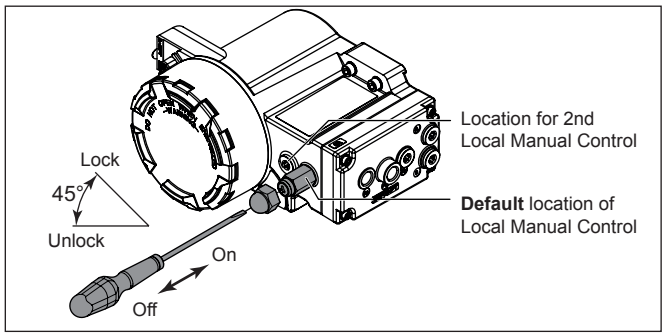
Local Manual Control

Description

For commissioning, emergency or maintenance purposes, the FieldQ can be supplied with one or two Manual Control options. These can operate the pilot valve(s) inside the module and as such operate the actuator, when there is air pressure available, but no control signal or power supply.

Notes:

- One Local Manual Control is required for normal operation of Double acting or Spring return actuators.
- For Double acting actuator with a Fail-in-last position function, a second Local Manual Control can be mounted.
- These options can be ordered together with the Control Module or as a kit to be mounted later.
- For option ordering codes, see page 7



Local Manual Control option

Speed Control

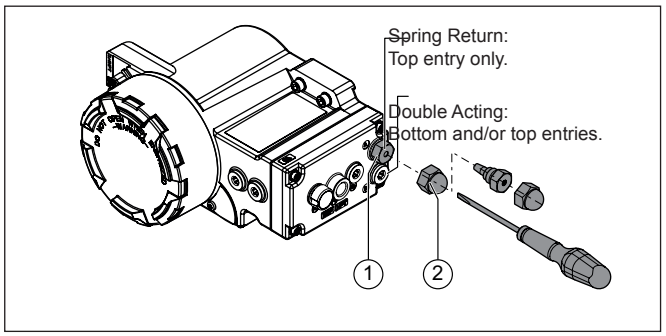
Description

The FieldQ can be supplied with a Speed Control option. One throttle is required for Spring Return actuators and up to two for Double Acting actuators.
The speed control throttle controls the air flow in and out of an air chamber and as such limits the speed of the “Opening” and “Closing” stroke simultaneously. This throttle consists of :

1 Nut cover
2 Main throttle with set screw.

Note:

- For Spring Return actuators with one speed control throttle, it is not possible to set both the stroke cycle times to an equal time.
- Four Double Acting actuators it is possible to mount two speed control throttles.
- The actual stroke cycle times depend on the actual load on the actuator during the different strokes.



Speed control options

Hazardous area specifications

Modules QC41, QC42 and QC43

Below specification are applicable for QC41, QC42 and QC43 modules with a hazardous area approval.

Hazardous area product marking;

IECEx hazardous or Classified Location:

Ex d IIB+H2 T4/T6 Gb
Ex t IIIC T80°C Db
IECEx DEK 15.0034X

ATEX hazardous or Classified Location:

CE 1180
Ex II 2G Ex db IIB+H2 T4/T6
Ex II 2D Ex tb IIIC T80°C
DEKRA 15ATEX0055X

FM hazardous or Classified Location:

CL I, II, III, DIV 1
Groups BCDEFG, T4/T6, Type 4X/6
CL I, ZN 1, IIB+H2, T4/T6

CSA hazardous or Classified Location:

Class I, II, III, DIV 1
Groups CDEFG, T4/T6, Type 4X/6
Ex d IIB+H2 T4/T6
DIP A21 TA 80°C

Notes:

1 Each control module is marked with the applicable ambient temperature marking.
2 Metric control modules are marked with ATEX and IECEx markings.
3 Imperial control modules are marked with ATEX, IECEx, FM and CSA markings.

Temperature rating

Table 7: Temperature rating for use in areas with a potential explosion hazard.

Configuration				Temperature (°C)			
Module type	**Switch cartridge**	**Pneumatic action**	**Max. Power dissipation**	**Min. ambient**	**Max. ambient**	**Max. Surface**	**Class**
QC41 (24VDC)	M, G O, C, N, H	S,D,F	3.6W (2	-25°C (-13°F)	+60	+80	T6/T4
QC42, QC43 (115 or 230VAC)		S,D	3.6W (2	-25°C (-13°F)	+60	+80	T6/T4
QC42, QC43 (115 or 230VAC)		F	7.2W (3	-25°C (-13°F)	+60	+80	T6/T4

Notes:

1 1x or 2x 24VDC pilot valves, or 1x 115/230 VAC pilot valve
2 2x 115 or 230 VAC pilot valves

Switch cartridge

M = Mechanical switches
G = Mechanical switches (gold contacts)
C = 3 wire PNP proximity switch
O = 3 wire NPN proximity switch
N = 2 wire proximity switch
H = 2 wire proximity switch

Pneumatic action

S = Spring Return (Single acting).
D = Double acting.
F = Double acting (Fail in Last Position)

Corrosion protection FieldQ

Modules QC41, QC42 and QC43

Description

The corrosion protection system of FieldQ actuators consist of the following treatments or materials:

1 Pretreatment

The actuator housings are anodized inside and outside, to give them a durable and superb protection against wear and corrosion.

2 De-greasing.

All aluminum parts are de-greased before the coating is applied by washing with an alkaline solution to assure the best bonding between the aluminum surface and the coating.

3 Finish

3.1 Actuator

Polyurethane powder coating for exterior use.
The powder coating is applied cold using automatic electrostatic spray equipment and is cured for about 10 minutes at minimum 200°C (392°F) offering excellent light and weather resistance.

3.2 Module

Polyurethane coating for exterior use.
The coating offers excellent light and weather resistance.
Good chemical resistance against most bases, acids, solvents, alkalis and oils at normal temperatures.
Excellent exterior mechanical durability.

4 High grade & hard anodized aluminum pinion.

Actuators with high grade & hard anodized aluminum pinions, passed a 1000 hours salt spray test.

5 Stainless steel or coated steel parts.

External parts are stainless steel or coated alloy steel.

6 Corrosion protected springs on Spring Return actuators

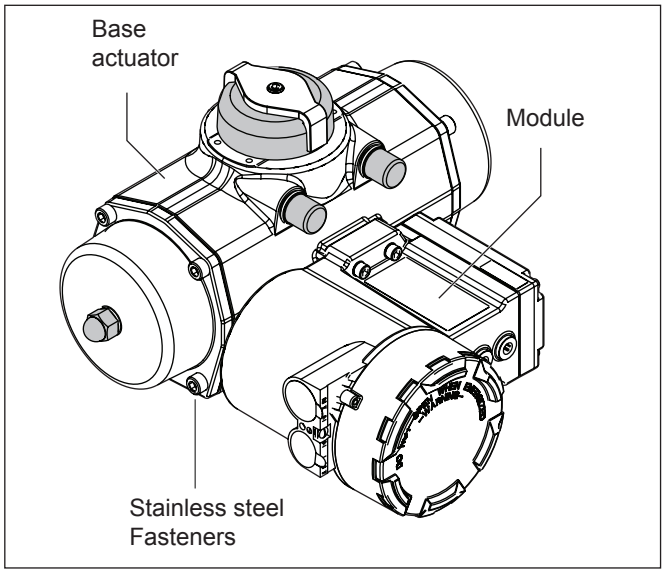
All the springs of spring return actuator are Deltatone® or epoxy (black) coated to prevent the corrosion of the springs and assure a long cycle life.

Technical data base actuator

Finish:	Polyurethane powder coating	
Thickness:	80 to 160 micrometer (3.1 to 6.2 mils).	
Salt spray test:	1000 hours (ASTM B117)	
Color:	Yellow	
Materials:	Housing:	Anodized aluminium alloy
	Pistons:	Chromatized
	Pinion:	High grade aluminum alloy, hard anodized
	Fasteners:	Stainless steel or coated alloy steel.
	Type plate:	Stainless steel

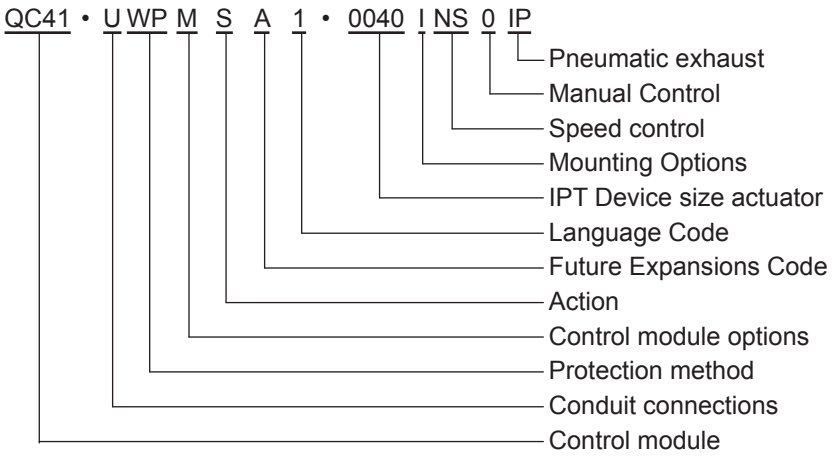
Technical data Control Module

Finish:	2 Component with an epoxy primer and polyurethane enamel top coating.	
Thickness:	80 to 160 micrometer (3.1 to 6.2 mils).	
Salt spray test:	1000 hours (ASTM B117)	
Color:	Yellow	
Materials:	Housing:	Anodized aluminium alloy
	Fasteners:	Stainless steel or coated alloy steel.
	Type plate:	Vinyl



Control Module Configuration:

Modules QC41, QC42 and QC43



Sample code:

QC41 • UWPMSA1 • 0150INS0IP

- Control module with 24 VDC pilot valve
- •
- Imperial unit with 1/2"NPT and 3/4"NPT electrical entries and 1/4"NPT pneumatic entry.
- Weather proof module (IP66/NEMA4x)
- Mechanical feedback switches
- Suitable for Spring Return actuators
- •
- With IPT probe for Q150 size actuator
- Not installed to actuator (separate Control module)
- No speed control option
- No manual control option
- With IP65/NEMA4 exhaust

Control module	
QC41	Control module with 24 VDC pilot valve
QC42	Control module with 115 VAC pilot valve
QC43	Control module with 230 VAC pilot valve

Connections	
M	Metric
U	NPT

Protection method	
WP	Weather Proof IP66/NEMA4X
P5	Flame- or Explosion proof approval (see note 1)

Control module options (position feedback)	
M	Mechanical switch
G	Mechanical switch (Gold Plated)
O	3-wire prox. switch PNP
C	3-wire prox. switch NPN
N	2-wire prox. switch (NAMUR)
H	2-wire prox. switch (20-140 VAC/10-140 VDC)

Action	
S	Single acting actuator
D	Double acting actuator
F	Double acting - Fail-In-Last-Position

Future Expansions Code	
A	Standard

Language Code	
1	English

IPT Device size for actuator:	
0040	Q40 actuator
0065	Q65 actuator
0100	Q100 actuator
0150	Q150 actuator
0200	Q200 actuator
0350	Q350 actuator
0600	Q600 actuator
0950	Q950 actuator
1600	Q1600 actuator
0000	No IPT probe

Mounting Options	
U	Uninstalled
I	Installed/Tested to actuator

Speed control	
NS	No Speed Control
N1	Spring Return (1x throttle)
N2	Double acting (2x throttle)

Manual Control	
0	No Manual Control
1	1x "Push&Lock", anodized aluminum
2	2x "Push&Lock", anodized aluminum

Pneumatic exhaust	
IP	IP65/NEMA4 rated exhaust
IN	Non metalic exhaust / Check valve
ZZ	Special exhaust

Note:

1 Metric control modules are marked with ATEX and IECEx markings.
2 Imperial control modules are marked with ATEX, IECEx, FM and CSA markings.
3 The options below are all options available. Not all options apply to all configurations.

Integrated Control modules

QC54 with FOUNDATION™ Fieldbus digital communication.

Features:

- **Basic actuator functions for:**
  - Spring return applications, or
  - Double acting applications or,
  - Double acting Fail in Last Position applications.
- **Suitable for all Q-Series actuator sizes.**
- **FOUNDATION™-Fieldbus digital communication.**
- **IPT-technology (Intelligent Position Tracking).**
- **Initialization by FOUNDATION™- Fieldbus or Push Button for easy setup of the actuator.**
  - Press and confirm press the "Auto-Init" button starts auto-initialization procedure.
  - Initialization sets automatically the switch points for the position feedback of the actuator.
  - Initialization checks if the actuator and control module configuration match. This procedure will detect the action type (Fail-Open, Fail-Close or Fail in last position) and generate an alert if there is a configuration issue.

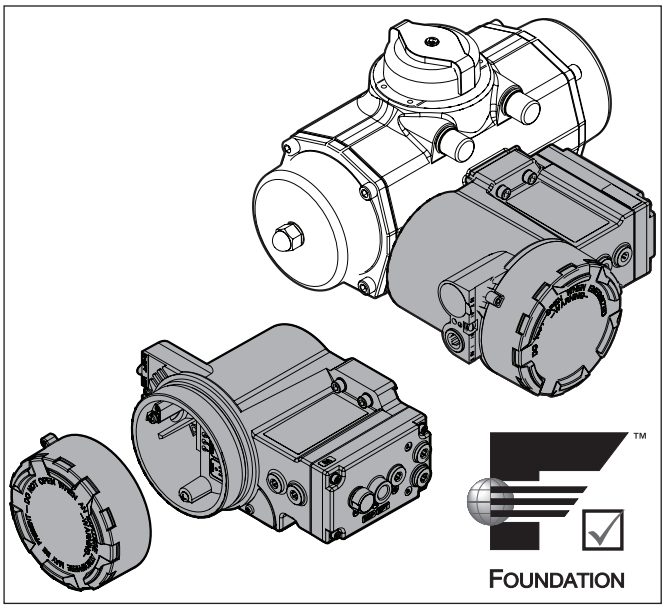


Fig. 1. Control module QC54 with FOUNDATION™-Fieldbus bus communication

- **Readjustable or Reversible position feedback using the re-reassignment buttons or by FOUNDATION™ Fieldbus.**
- **Adjustable switch points can be adjusted from 5% to 30% before the end of the stroke by FOUNDATION™ Fieldbus.**
- **Three indication LED's for "Status", "Open" and "Closed" position. Status LED indicates:**
  - Initialization procedure running (blinking),
  - Successful initialization procedure (LED is on) or
  - No or failed initialization (flashing) or
  - A particular unit in the field.
- **Control Module can be easily mounted to the actuator**
- **Available as "Weather Proof" for indoors or outdoors use.**
  - The robust aluminum alloy enclosure (IP66/ NEMA4X rated), protects the IPT system, pneumatic components, the feedback switches and terminals and makes it suitable for indoor and outdoor use.
- **Lockable Control Module cover.**
- **One larger entry (3/4"NPT) is available for larger multi-core cables on imperial units.**

Description:

This Q-Series QC54 Control Module offers an integrated concept for valve automation. Its compact and robust construction incorporates basic control and feedback functionality and communicates through the FOUNDATION™- Fieldbus protocol.
All electrical and pneumatic control components are located inside one module housing making it a compact and robust construction incorporating basic control and feedback functionality and is suitable for indoor and outdoor use.

Construction:

The Control Module is mounted at the side of the basic actuator housing. Inside, wiring terminals are available for connecting the FOUNDATION™- Fieldbus signals. Two cable entries are available.
One pneumatic connection is available to feed the control module. The pilot valves inside the control module are used to send the actuator to its open or closed position.

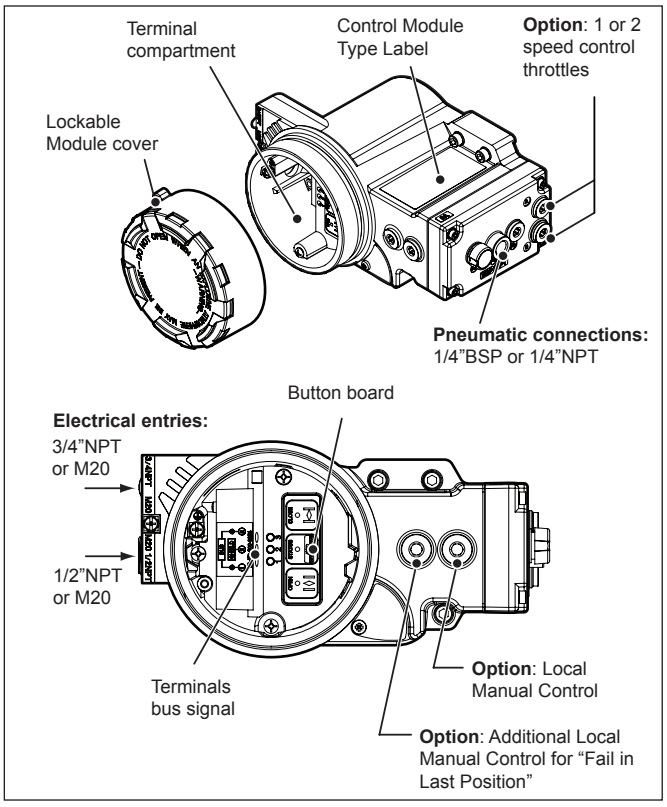


Fig. 2. Control module overview

General specifications:

Material housing:	Aluminium alloy
Operating media:	Air or inert gasses, filtered at 5µm
Pneumatic entry:	Metric units: G1/4" Imperial units: 1/4”NPT
Electrical connections :	Internal 3 pole terminal strip for bus signal Internal and external earth connection Optional quick connectors: 7/8" or M12 connector (see page 9)
Cable entries:	Metric units: 2x M20x1.5 Imperial units: 1/2” and 3/4"NPT
Enclosure:	Rated IP66 - NEMA4X
Switch points:	Factory set at 15° before each end of travel (open and closed position).
- Adjustable range:	Between -3° to 15° and +75° to +93° of the end position.
Finish:	Chromated with polyurethane based coating.
Temperature range:	-20°C to +50°C (-4°F to +122°F)

Dimensions:

Metric:	See data sheet 1.603.08
Imperial/UNC:	See data sheet 1.603.09
DIN 3337:	See data sheet 1.603.10

Electrical safety requirements:

Use:	In- and outdoor.
Altitude:	Operating full power available up to 2000 meter (6000 feet).
Maximum relative: humidity	80% for temperatures up to 31°C (87.8°F) decreasing linearly to 50% relative humidity at 40°C (104°F).
Mains supply: fluctuation	Up to ±10% of nominal voltage
Over voltage category:	II
Pollution degree:	2 (3 when the cover remains closed)

Communication Protocol:

Protocol :	FOUNDATION™-Fieldbus
Transmission :	H1, IEC 61158-2
Maximum current :	18mA from bus
Required external : protection current	Restrict the power supply to <600mA.

Function blocks

The Control Module provides the following function blocks:
- Resource Block (RB)
- Transducer Block (TB)
- Analog Input (AI) Function Block
- Discrete Output (DO) Function Block
- 2x Discrete Input (DI) Function Block
- PID Function Block

Diagnostics and Alerts

Standard FOUNDATION™- Fieldbus diagnostics and alerts provided meets Emerson PlantWeb Alerts standard. Applicable diagnostics include:
- Travel times for the Open stroke, Close stroke and Average travel times.
- Cycle Counters for Control Module, Pneumatic Module, Actuator and Valve
- Time in Position
- Various internal electronic health tests.
- Instrument temperature.

For more detailed information on diagnostics see page 10 and 11.

Pneumatic control

Pneumatic control variations

The Control Module contains all the necessary pneumatic components to control the actuator and control the incoming and outgoing airflow. Pneumatically the modules are available for three applications:

1 Spring return or
2 Double acting or
3 Double Acting - "Fail-in-Last-Position".

To achieve these functions, each Control Module can be fitted with one or two pilot valves depending on the required functionality:

1 One pilot valve is default and suitable for normal operation of double acting or spring return actuators
2 Two pilot valves are required to achieve a "Fail-in-Last-Position" functionality on double acting actuators.

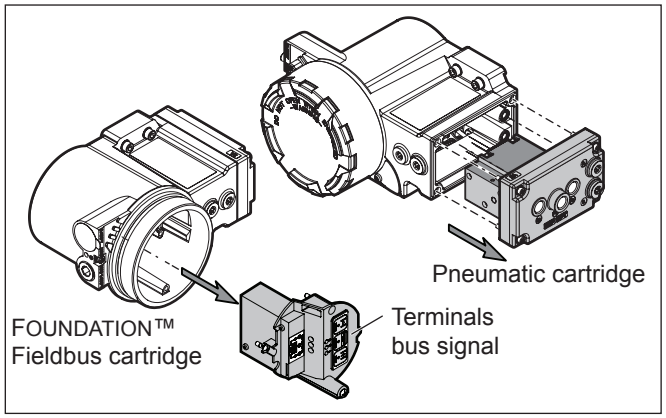


Fig. 3. Pilot valve and pneumatic cartridge

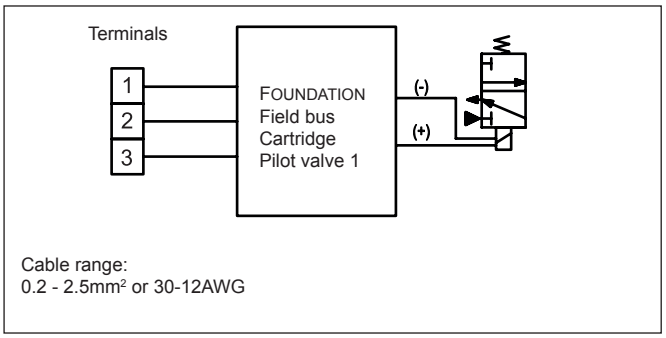


Fig. 4. One pilot valve and wiring connections for standard Double Acting or Spring Return applications

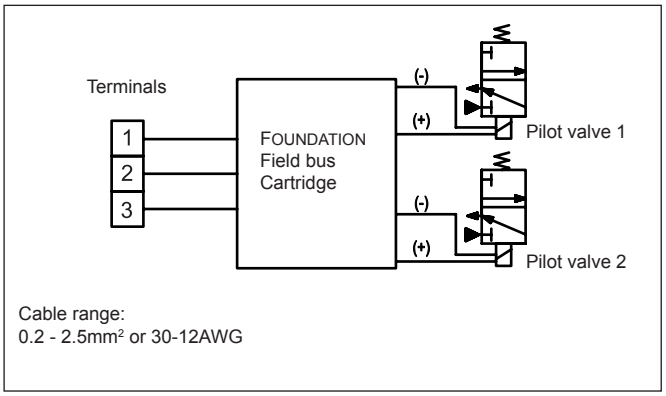


Fig. 5. Two pilot valves and wiring connections for Double Acting "Fail in Last Position" applications

Pneumatic components

The pneumatic components inside the module consist out of one or two pilot valves and a 3/2 spool valve or 5/2 bistable spool valve. The spool valves are pneumatically operated by the pilot valves.
To assure trouble-free operation, the spool valves are equipped with big ports. This enables a large air flow and makes it less sensitive for contamination of the internals. The large air flow also fast cycle times and enables it to be utilized for the entire Q-Series Series actuator range.

Internal corrosion protection:

The spring return models have standard a built in “Breather” function. During the spring stroke, the exhaust air from the center chamber (A-Port) is first fed to the spring chamber (B-port) preventing air from outside from being sucked into the spring chamber. This reduces the possibility of internal corrosion and maximizes the actuators’ working life.

Pneumatic options

Speed Control

The QC54 control module can be supplied with a Speed Control option. One throttle is required for Spring Return actuators and up to two for Double Acting actuators.
The speed control throttle controls the air flow in and out of an air chamber and as such limits the speed of the “Opening” and “Closing” stroke simultaneously.

Silencers and vents

The exhaust ports Ra and Rb on the module are shipped from the factory with transport protection.
The module can be equipped with either silencers or vents.

Manual Control

For commissioning, emergency or maintenance purposes, the QC54 control module can be supplied with Manual Control options. These options can operate the actuator when there is air pressure available, but no control signal or power supply.

- For normal operation the module should be fitted with one Manual Control.
- For Double Acting with a Fail-in-Last-Position function, two Manual Control can be fitted.

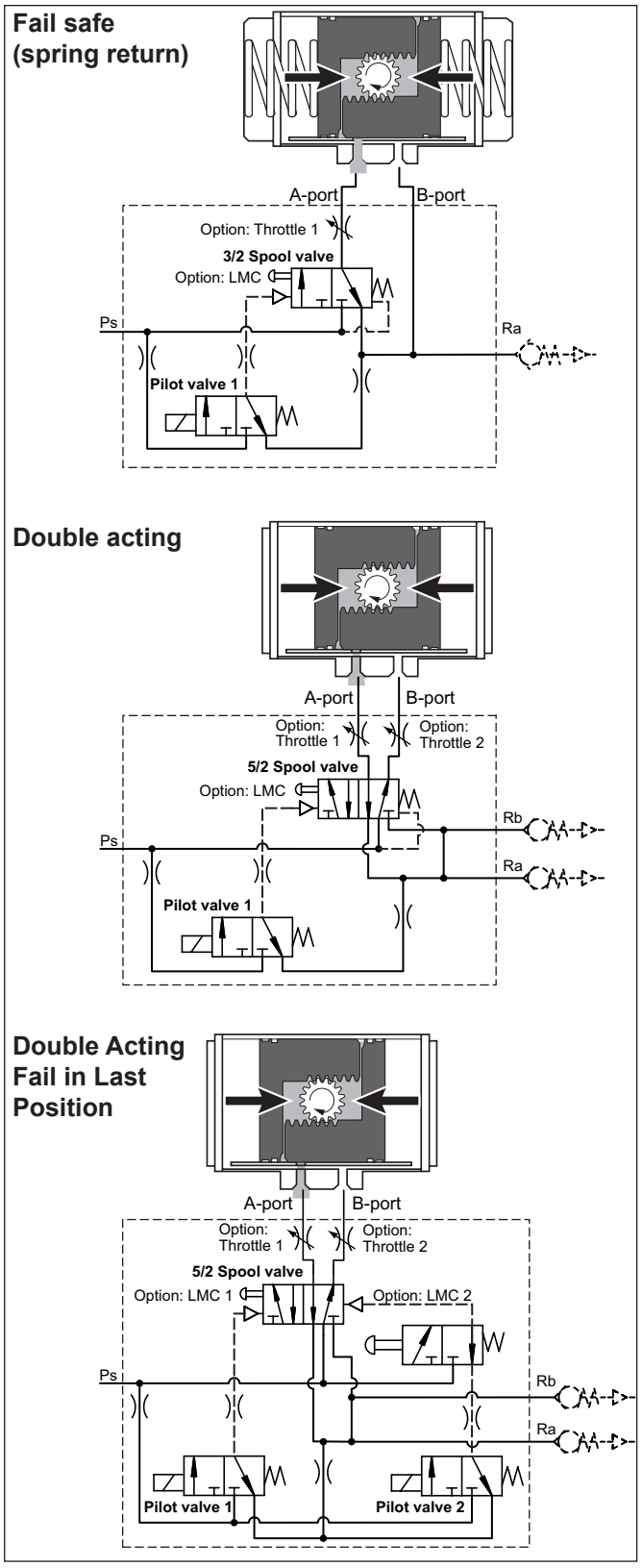


Fig. 6. Pneumatic operation

Switch point setting

The QC54 control modules are equipped with a button board that allows you to set or readjust the switch points for the position feed back.

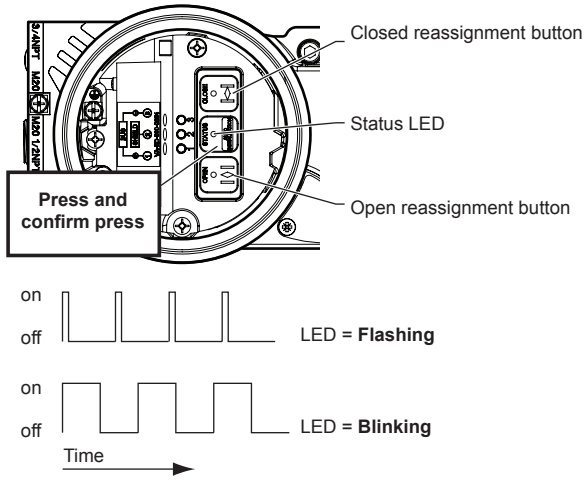


Fig. 7. Button board

Button board functions:	
Initialization button:	Start Auto-Initialization procedure
Close button:	Re-adjustment of the "Closed" switch point
	Set to factory settings
Open button:	Re-adjustment of the "Closed" switch point
	Set to factory settings

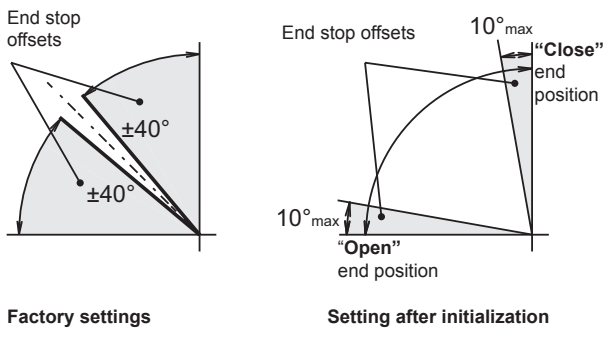


Fig. 8. Switch point setting

Auto-Initialization

Initialization sets automatically the switch points for the position feedback of the actuator and checks if the actuator and control module configuration match. This procedure will detect the action type (Fail-Open, Fail-Close or Fail in last position) and generate an alert if there are configuration issues.
This process is done automatically, by the module, however, the user must start it and the unit must be wired and powered.
Digital communication is not required but power supply is necessary (9V to 32V DC). The initialization process can be started in one of two ways:

1. Initialization using the local buttons (see fig. 7).
2. Initialization using a bus command (see Reference manual QC54, DOC.RM.QC54.E)

Indication LED's

Three indication LED's for "Status", "Open" and "Closed" position are available. The status LED indicates:
- Initialization procedure running (blinking),
- Successful initialization procedure (LED is on) or
- No or failed initialization (flashing)

Recognize Function

An additional function of the Status LED is the recognize function. To recognzie a particular unit in the plant, the "Recognizing LED" function can be activated in the transducer block. When this function is activated, the Status LED will blink for 300 seconds (5 minutes).

Changing Switch Point Setting

Readjustment of switch points

When switch point re-adjustment is required but it is not allowed that the actuator/valve unit cycles, the new switch point can be set by pressing the corresponding "Open" or "Closed" button.

Factory settings

Pressing both the Open and Close reassignment buttons, while powering up, will set the module back to its factory settings.

Control Module Options

Local Manual Control

Description

For commissioning, emergency or maintenance purposes, the QC54 control module can be supplied with one or two Manual Control options. These can operate the pilot valve(s) inside the module and as such operate the actuator, when there is air pressure available, but no control signal or power supply.

Notes:

- One Local Manual Control is required for normal operation of Double acting or Spring return actuators.
- For Double acting actuator with a Fail-in-last position function, a second Local Manual Control can be mounted.
- These options can be ordered together with the Control Module or as a kit to be mounted later.
- For option ordering codes, see page 7

Speed Control

Description

The QC54 control module can be supplied with a Speed Control option. One throttle is required for Spring Return actuators and up to two for Double Acting actuators. The speed control throttle controls the air flow in and out of an air chamber and as such limits the speed of the “Opening” and “Closing” stroke simultaneously. This throttle consists of :

1 Nut cover
2 Main throttle with set screw.

Note:

- For Spring Return actuators with one speed control throttle, it is not possible to set both the stroke cycle times to an equal time.
- Four Double Acting actuators it is possible to mount two speed control throttles.
- The actual stroke cycle times depend on the actual load on the actuator during the different strokes.

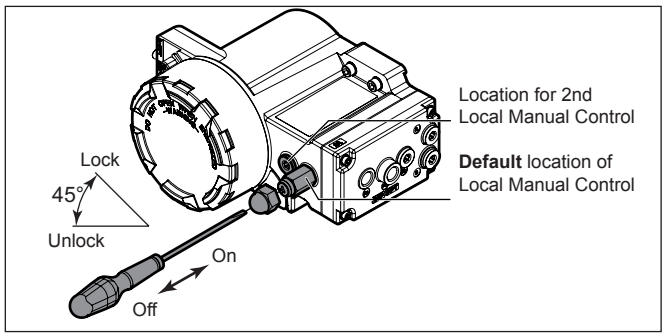


Fig. 9. Local Manual Control option

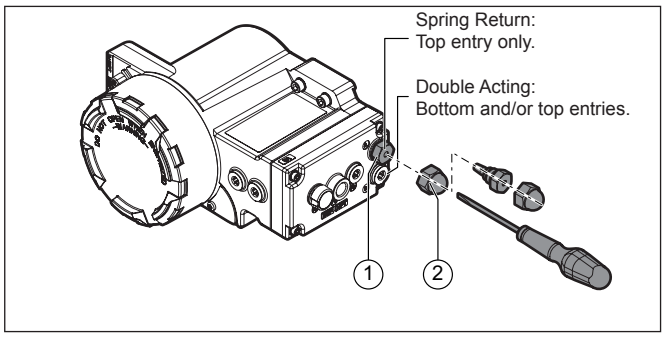
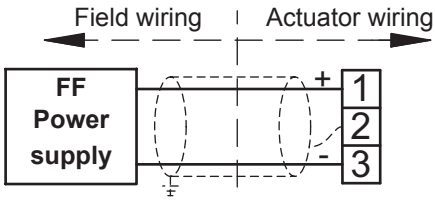


Fig. 10. Speed control options

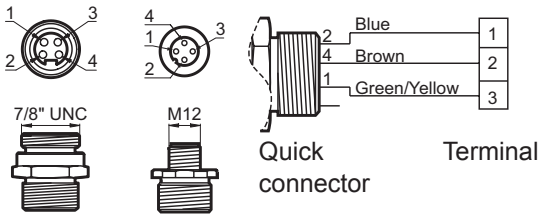
Wiring and Quick Connectors

FOUNDATION™ Fieldbus terminal wiring

The QC54 module can be connected to the system by hard wiring the module to the terminals The QC54 Module can optionally be equipped with prewired quick connectors. Two versions are available: 7/8" or M12 (male chassis part).



Quick connector pinouts:
(male chassis part)



Wiring for hazardous areas

Detailed safe area, Intrinsically safe or Non-Incendive/ Non-Sparking wiring instructions, will be shipped with the product, see Installation Guide : DOC.IG.QC54.1

Quick connectors

Quick connectors, as shown are excluded for non-Incendive or non-sparking use in hazardous area's classified as Zone 2 or 22 or Cl I, II, III, Div. 2.

Wiring dimensions

Solid wire : 2.5mm^2 max.
Stranded wire : 0.2-3.3mm^2 or 24-12 AWG

Diagnostics and PlantWeb Alerts

QC54 FOUNDATION™ Fieldbus

Diagnostics

The Q-Series QC54 Control Module with FOUNDATION™ Fieldbus communication has diagnostic capabilities. These process parameters can give information about communication condition, valve and/or actuator unit. It enables to predict failures in advance and makes maintenance easier to schedule. The following diagnostics are available for the QC54 control module:

1 Timer parameters:

1 Open and Closed travel time
2 High and low limits of Open and Closed travel time
3 Average travel times of last 30 strokes of Open and Closed travel.
4 High and low limits of average Open and Closed travel time

2 Cycle Counters

1. Control Module - Counts how many times the Control Module cycles (read only).
2. Pneumatic Module - Counts how many times the Pneumatic Module cycles.
3. Actuator - Counts how many times the actuator cycles.
4. Valve - Counts how many times the valve cycles.

3 Time In Position

5 Various internal electronic health tests.

PlantWeb Alerts

PlantWeb Alerts are alerts that have been predefined and categorized for the user. These device alerts can be used to help troubleshoot the instrument (see also page 4). There are three categories:

- **Failed alerts,**
  A failed alert indicates a failure within the device that will make the device, or some part of the device, non-operational.
- **Maintenance alerts**
  A maintenance alert indicates that the device, or some part of the device, needs maintenance soon.
- **Advisory alerts**
  An advisory alert indicates a condition that does not have a direct impact on the device's primary function. If the condition is ignored, the device will eventually fail.

These alerts, when enabled, can participate in the DeltaV alarm interface tools such as the alarm banner, alarm list, and alarm summary.

Diagnostics and PlantWeb Alerts

Alerts & recommended actions			Alert default setting					
			Advisory		Maintenance		Fail	
Alerts		Recommended actions	enable	mask *	enable	mask *	enable	mask *
bit 0	Reserved							
bit 1	Internal alerts, bad position sensor	Feedback problem, replace control module when possible	n	n	y	y	n	n
bit 2	Internal alerts, bad temperature sensor	Temperature sensor problem, replace Control Module when possible	n	n	y	y	n	n
bit 3	Internal alerts, Specified system temperature exceeded	Take corrective actions to bring temperature within specified range.	n	n	y	y	n	n
bit 4	Internal alerts, Software error		n	n	y	n	n	n
bit 5	Internal alert, travel deviation	Lost position, Check air pressure	y	y	n	n	n	n
bit 6	Internal alerts, Shutdown is set	Internal communications problem, check shutdown configuration for restart, Replace Control Module.	n	n	n	n	y	y
bit 7	Internal alerts, Undefined error		n	n	y	n	n	n
bit 8	Counter alerts, Control Module life cycle exceeded	Control Module life cycle exceeded, Replace Control Module	n	n	y	y	n	n
bit 9	Counter alerts, Pneumatic Module life cycle exceeded	Pneumatic Module life cycle exceeded, Replace Pneumatic Module.	n	n	n	n	n	n
bit 10	Counter alerts, Actuator life cycle exceeded	Actuator life cycle exceeded, Replace actuator.	n	n	n	n	n	n
bit 11	Counter alerts, Valve life cycle exceeded	Valve life cycle exceeded, take Valve requires maintenance.	n	n	n	n	n	n
bit 12	Timer alerts: time in position limit	Time in position exceeded, appropriate action.	n	n	n	n	n	n
bit 13	Timer alerts: open travel time limit exceeded	Open travel timer exceeded, check valve system.	n	n	n	n	n	n
bit 14	Timer alerts: close travel time limit exceeded	Close travel timer exceeded, check valve system.	n	n	n	n	n	n
bit 15	Initialization Failed (reason from AUTO_INITIALIZATION STATUS)	Check air pressure, check actuator sizing, check valve system.	y	y	n	n	n	n
bit 16	Reserved Primary Value Failure							
bit 18	Reserved HW/SW Incompatibility		n	n	n	n	n	n
bit 19	Reserved IO Failure (FF card lost IO board)	Internal communications are lost, device will act according to shutdown configuration.	y	y	n	n	n	n
bit 20	Reserved Mechanical Failure							
bit 21	Reserved TB NV Memory Failure							
bit 22	Reserved RB NV Memory Failure		y	y	n	n	n	n
bit 23	Reserved TB Electronics Failure		y	n	n	n	n	n
bit 24	Reserved RB Electronics Failure		y	y	n	n	n	n

(*) Mask “n” indicates masked out (not visible).
For more detailed information about the configuration of the QC54 Foundation Fieldbus Module see Reference Manual DOC.RM.QC54.E. This manual is available for download from www.FieldQ.com.

Control Module Configuration:

QC54 . U WP G S A 1 . 0040 I NS 0 IP 0 1

- Top entry glands and plugs
- Bottom entry glands and plugs
- Pneumatic exhaust
- Manual Control
- Speed control
- Mounting Options
- IPT Device size actuator
- Language
- Future Expansions
- Action
- Control module options
- Protection method
- Conduit connections
- Control module

Sample code:

QC54 • UWPSSA1 • 0150INS0IP01
- Control module with FOUNDATION™ Fieldbus
•
- Imperial unit with 1/2"NPT and 3/4"NPT electrical entries and 1/4"NPT pneumatic entry.
- Weather Proof
- Standard control module
- Suitable for Spring Return actuators
•
- With IPT probe for Q0150 size actuator
- Installed to actuator.
- No speed control option
- No manual control option
- With IP65/NEMA4 exhaust
- Transport plug in bottom entry
- Metal blind plug in top entry

Control Module Type	
QC54	Foundation Fieldbus communication
•	
Conduit connections	
M	2x M20 x 1.5
U	Top: 3/4"NPT, Bottom: 1/2" NPT
Protection method	
WP	Weatherproof: IP66/NEMA4X (no approvals)
Control Module Switch Type	
S	Standard configuration (only for QC54)
Module Action	
S	Single acting
D	Double acting
F	Double Acting Fail in Last Position
Future Expansion	
A	Standard Yellow
Language Code	
1	English
•	
IPT probe size for actuator	
0040	Q40 actuator
0065	Q65 actuator
0100	Q100 actuator
0150	Q150 actuator
0200	Q200 actuator
0350	Q350 actuator
0600	Q600 actuator
0950	Q950 actuator
1600	Q1600 actuator
0000	No IPT probe

Mounting Options	
I	Installed On Actuator
U	Uninstalled
Speed control	
NS	No Speed Control
N1	Spring Return (1x throttle)
N2	Double acting (2x throttle)
Manual Control	
0	No Manual Control
1	1 x Manual Control (Push&Lock)
2	2 x Manual Control (Push&Lock)
Pneumatic exhaust	
IP	IP65/NEMA4 rated exhaust
IN	Non metalic exhaust / Check valve
ZZ	Special exhaust

Glands & Plugs (see note 1)			
Bottom entry		**Top entry**	
0	Transport plug	**0**	Transport plug
1	Metal blind plug	**1**	Metal blind plug
2	Plastic Gland	**2**	Plastic Gland
3	Metal Gland	**3**	Metal Gland
4	Eurofast (M12)	**4**	Eurofast (M12)
5	Minifast (7/8")	**5**	Minifast (7/8")

Note:
1 The options below are all options available. Not all options apply to all configurations.

Namur NE-107 Alarms

This section describes the parameter interaction to implement a FieldQ™ QC54 Control module to the NAMUR NE-107 requirements as a parameter group in the Resource Block. There are four alarm categories defined as per the NE-107 specification, Failed, Off Specification, Maintenance, and Check function.

Maintenance Although the output signal is valid, the wear reserve is nearly exhausted or a functions will soon be restricted due to operational conditions e.g. build-up of deposits

Off Specification Off-spec means that the device is operating outside its specified range or an internal diagnostic indicates deviations from measured or set values due to internal problems in the device or process characteristics (e.g. bubble formation in flow metering or valve sticking).

Check Function Output signal temporarily invalid (e.g. frozen) due to on-going work on the device.

Failed Output signal invalid due to malfunction in the field device or its peripherals.

Each of these categories share 32 conditions that can be defined by the device manufacturer. Each condition may be mapped or not mapped for each category. If a condition is mapped then it is indicated in the* ACTIVE parameter. If the condition in the * ACTIVE parameter is not masked by the corresponding bit in the *_MASK parameter then the condition will be queued for broadcast using the corresponding *ALM parameter at the associated priority indicated by *PRI parameter. The 4 categories are defined below.

The conditions are not expected to identify explicitly the root cause of the condition, but rather to identify it in terms of:
- Replace the device
- Replace a part of the device
- Correct a configuration problem
- Fix something outside of the device

The above list is all that the operator needs to know to restore his process functionality and if there are more than 31 device conditions they should be grouped by definition into these bit

Parameter Mnemonic	Obj Type	Data Type/ Structure	Use/Model	Store	Size	Valid Range	Initial Value	Permission	Other	Range Check
FD_CHECK_ACTIVE	S	Bit String	C/FD Active	D	4				Read only	
FD_CHECK_ALM	R	DS-87	C/Alarm	D	15					
FD_CHECK_MAP	S	Bit String	C/Contained	S	4			ALARM		
FD_CHECK_MASK	S	Bit String	C/Contained	S	4			ALARM		
FD_CHECK_PRI	S	Unsigned8	C/Alert Priority	S	1	0 - 15	0	ALARM		Yes
FD_EXTENDED_ACTIVE_n	S	Bit String	C/Contained	D	4				Read only	
FD_EXTENDED_MAP_n	S	Bit String	C/Contained	S	4					
FD_FAIL_ACTIVE	S	Bit String	C/FD Active	D	4				Read only	
FD_FAIL_ALM	R	DS-87	C/Alarm	D	15					
FD_FAIL_MAP	S	Bit String	C/Contained	S	4			ALARM		
FD_FAIL_MASK	S	Bit String	C/Contained	S	4			ALARM		
FD_FAIL_PRI	S	Unsigned8	C/Alert Priority	S	1	0 - 15	0	ALARM		Yes
FD_MAINT_ACTIVE	S	Bit String	C/FD Active	D	4				Read only	
FD_MAINT_ALM	R	DS-87	C/Alarm	D	15					
FD_MAINT_MAP	S	Bit String	C/Contained	S	4			ALARM		
FD_MAINT_MASK	S	Bit String	C/Contained	S	4			ALARM		
FD_MAINT_PRI	S	Unsigned8	C/Alert Priority	S	1	0 - 15	0	ALARM		Yes
FD_OFFSPEC_ACTIVE	S	Bit String	C/FD Active	D	4				Read only	
FD_OFFSPEC_ALM	R	DS-87	C/Alarm	D	15					
FD_OFFSPEC_MAP	S	Bit String	C/Contained	S	4			ALARM		
FD_OFFSPEC_MASK	S	Bit String	C/Contained	S	4			ALARM		
FD_OFFSPEC_PRI	S	Unsigned8	C/Alert Priority	S	1	0 - 15	0	ALARM		Yes
FD_RECOMMEN_ACT	S	Unsigned16	C/Contained	D	2	1 – manf spec	0		Read only	
FD_SIMULATE	R	DS-89	C/FD Simulate	D	9		disabled			
FD_VER	S	Unsigned16	C/Contained	S	2				Read only	

Control Module Options

Electrical entry options

Description

FieldQ Control Modules are shipped from factory with plugs in the electrical entries. These transport plugs avoid moisture or particles entering the module during transport and installation.
For installation purposes, FieldQ Control Modules can be fitted with glands, plugs or connectors in the electrical entries.

Option ordering codes

Modules QC01, QC02, QC03 and QC04			
Code :	Bottom entry	**Code :**	Top entry
0X	Transport plug	**X0**	Transport plug
1X	Metal blind plug	**X1**	Metal blind plug
2X	Plastic gland	**X2**	Plastic gland
3X	Metal Gland	**X3**	Metal Gland
Module QC30 and QC34			
Code :	Bottom entry	**Code :**	Top entry
0X	Transport plug	**X0**	Transport plug
1X	Metal blind plug	**X1**	Metal blind plug
2X	Plastic gland	**X2**	Plastic gland
3X	Metal Gland	**X3**	Metal Gland
4X	Eurofast (M12)	**X4**	Eurofast (M12)
5X	Minifast (7/8")	**X5**	Minifast (7/8")

Notes:
- The glands are suitable for cables from 6 to 12mm (1/4" to 1/2").
- Standard plastic glands will be black. For Intrinsically safe units, these glands will be blue.
- For Quick Connector details see data sheets 1.604.02 (QC34;FF) or 1.604.04 (QC30;ASI).

Manual Control

Description

For commissioning, emergency or maintenance purposes, the FieldQ can be supplied with Manual Control options. These options can operate the actuator when there is air pressure available, but no control signal or power supply. Two versions are available:

1 **"Push" version.** Pressing the spring return button will operate the actuator. Releasing the button will bring back the actuator in its original position.
2 **"Push & Lock" version.** To operate this optional Manual Control, use a screw driver (0.8x4mm). Push and turn it 90°, to lock it in position and keep the actuator in its operated state.
It is possible to rotate the screw multiple cycles. The unit will toggle every 90° between "locked" (1) and "unlocked" (0).

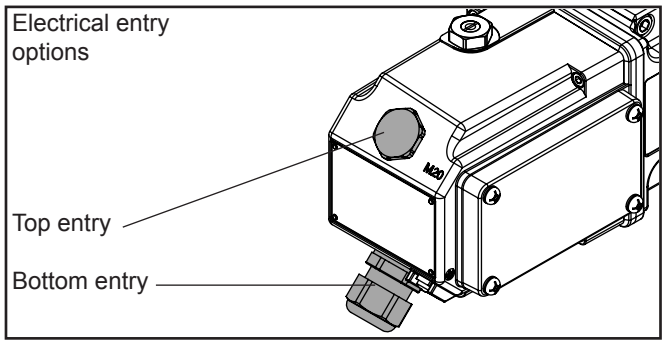
These options can be ordered together with the Control Module or as a kit to be mounted later.

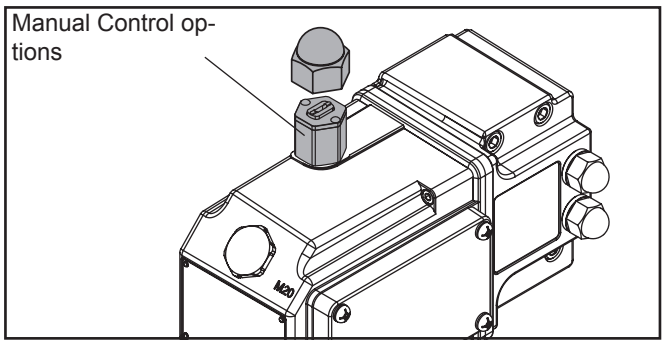
Materials

- Push version : Red anodized aluminum
- Push & Lock version : Red anodized aluminum

Option ordering codes

For modules QC01, QC02, QC03, QC04 , QC30 and QC34	
Code :	**Description:**
0	No Manual Control
1	Manual Control (Push)
2	Manual Control (Push&Lock)





Pneumatic Module

Description:

The Pneumatic Module is the pneumatic interface between the Control Module and the actual actuator. It controls the incoming and outgoing airflow. These modules are available in two basic executions:

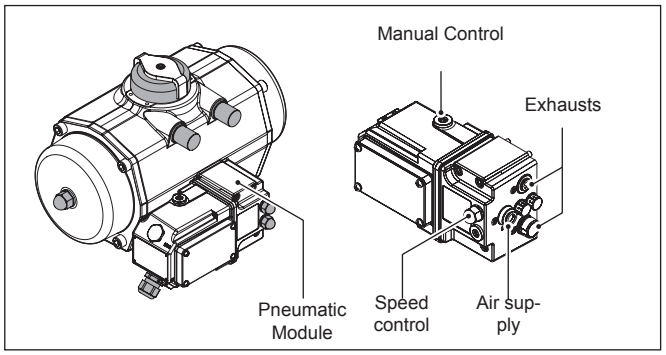
- Single acting (for spring return actuators)
- Double acting

Valve block:

The Pneumatic Module contains a valve block with two or four diaphragm/poppet valves (for single acting or double acting executions) . The valves are operated by a pilot valve in the Control Module.
To assure trouble-free operation, the valve block is equipped with big ports. This enables a large air flow and to makes it less sensitive for contamination of the internals. The large air flow also enables it to be utilized for the entire FieldQ range.

Breather Function:

The spring return models have standard a built in “Breather” function. During the spring stroke, the exhaust air from the center chamber is first fed to the spring chamber preventing air from outside from being sucked into the spring chamber. This reduces the possibility of internal corrosion and maximizes the actuators’ working life.



Manual Control

For commissioning, emergency or maintenance purposes, the FieldQ can be supplied with Manual Control options. These options can operate the actuator when there is air pressure available, but no control signal or power supply. Two versions are available:

- **Push**
- **Push and lock**

For more detailed information see data sheet 1.604.50

Options

Speed Control

Two integrated speed control options are available:

1 Speed control which throttles the air flow in one direction (exhausted air).
2 Speed control which throttles the air flow in both directions (supplied and exhausted air).

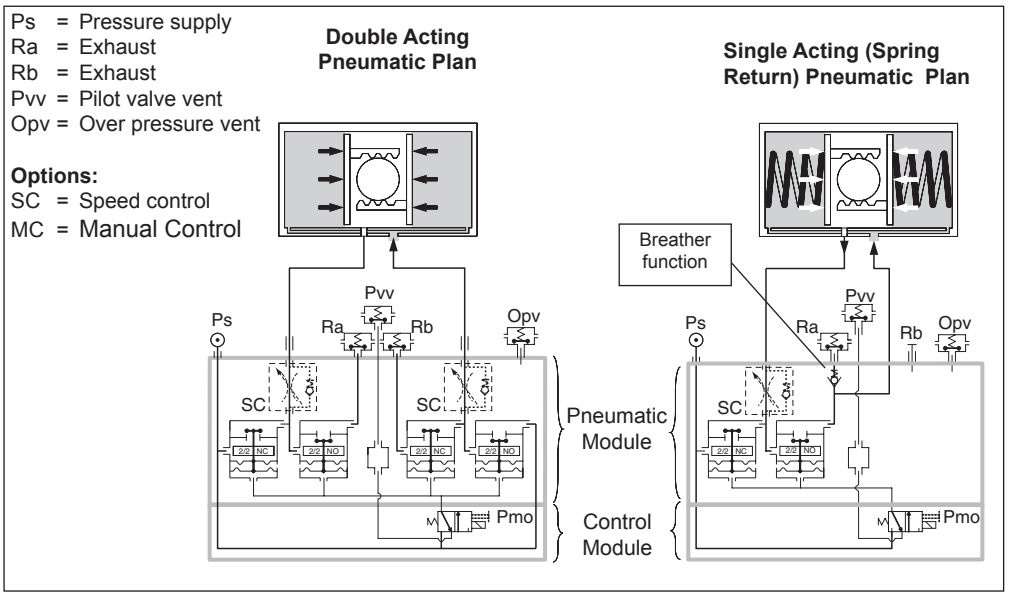
For more information on speed control see sheet 1.605.02 page 2.

Silencers and vents

The Pneumatic Module can be equipped with either silencers or vents. Dedicated IP65/NEMA4x rated vents are available.

Ps = Pressure supply
Ra = Exhaust
Rb = Exhaust
Pvv = Pilot valve vent
Opv = Over pressure vent

Options:
SC = Speed control
MC = Manual Control



Specification Pneumatic Module

Function : Double or Single Acting (spring return)
"Breather" function : Standard for single acting actuators
Pressure range
- Double acting : 2 to 8 bar g / 30 to 120psig
- Spring return : 6 to 8 bar g / 87 to 120psig with maximum spring set.
: 3 to 8 bar g / 43 to 120psig with reduced spring set.

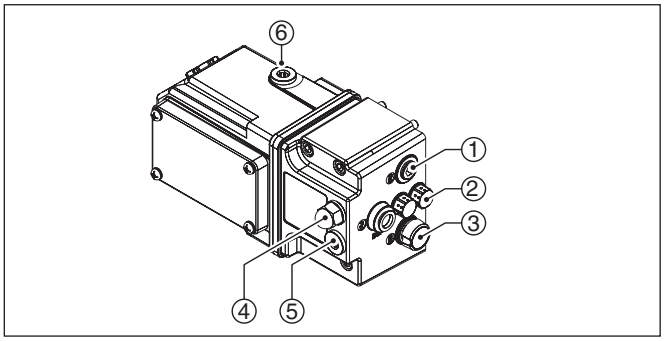
Enclosure : IP65/NEMA4X
Air entry : G1/4" or 1/4"NPT
Exhaust ports : G1/4" or 1/4"NPT

Operating media

Air or inert gasses, filtered at 50 micrometer. The following Control Modules require air filtered at 5 micrometer: QC03, QC04, and QC34. See applicable data sheets 1.604.xx.

Temperature

Depends on the utilized Control Module. See applicable data sheets 1.604.xxx.



Base Materials

Body	Aluminium
Valve housing	30% glass-filled Nylon
Finish	Polyester non-TGIC based powder coating
Valve seats	Buna-N
Membrane	Buna-N
Fasteners	Stainless Steel

Optional parts			
1	Plug	NPT	Steel, zinc plated
		BSP	Brass, nickel plated
2	Vents		Stainless Steel (AISI 303)
3	Exhaust	Base	Nylon
		Cover	Zinc Nickel plated and transparent passivated
		Option	Plastic silencer (nylon)
4	Speed Control		
	- Throttle		Stainless Steel (AISI 303)
	- Nut Cover		Nylon PA6
5	Plug		Brass Nickel plated
6	Manual Control		
	- Plug		Brass Nickel plated
	- Push		Red anodized aluminum
	- Push & Lock		Red anodized aluminum

Maximum Flow rates of FieldQ pneumatic modules

- The maximum flow rates depends mainly on the flow rates of the applied FieldQ pneumatic module

Pneumatic Module	**Stroke**	**Flow rates**		
		L/min.	**KV =**	**Cv =**
Double acting	Outward	350	4.7	0.33
	Inward	365	4.9	0.34
Single acting	Air	350	4.7	0.33
	Spring	240	3.2	0.23

Pneumatic Module Options

Speed Control on FieldQ actuators

Two integrated speed control options are available:

A "One-way" Speed control throttle

This throttle controls only the air flow exhausted from an air chamber and as such limits the speed of the "Opening" or "Closing" stroke (see table "Speed control configuration").
It consists of :

1 Nut cover
2 Main throttle with set screw
3 Spring loaded counter part

B "Two-way" Speed control throttle

This throttle controls the air flow in and out of an air chamber and as such limits the speed of the "Opening" and "Closing" stroke simultaneously (see table "Speed control configuration"). It consists of :

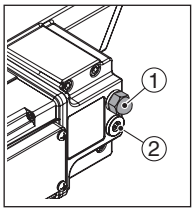
1 Nut cover
2 Main throttle with set screw.

Note:

With the "Two-Way" speed control it is not possible to set both the stroke cycle times to an equal time.
The actual stroke cycle times depend on the actual load on the actuator during the different strokes.

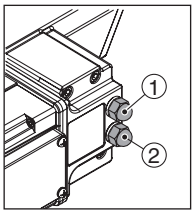
Speed control on spring return actuators

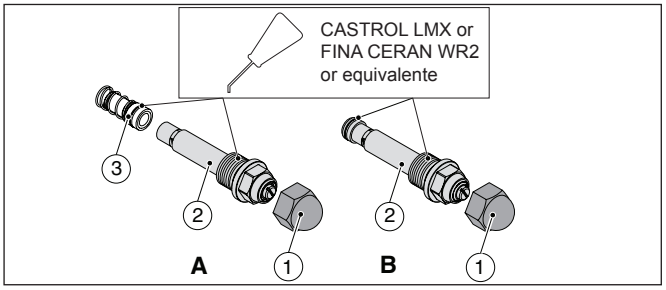
On spring return actuators only the "central" air chamber is pressurized and vented. Therefore both the "One-Way" or the "Two-Way" throttles must be mounted in the port for the central air chamber port (1). Port (2) must be plugged.



Speed control on double acting actuators

On double acting actuators both the "central-" and "end cap" air chambers are pressurized and vented. Therefore both the "One-Way" and "Two-Way" throttles can be mounted in either ports (1) or (2).

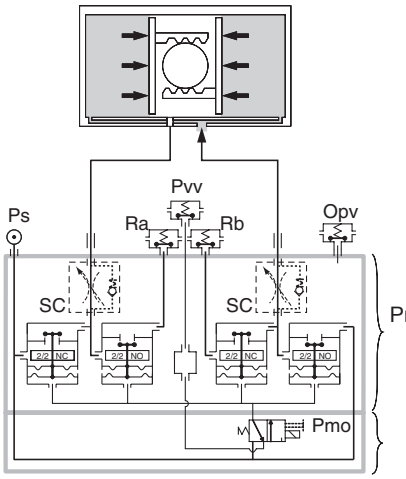




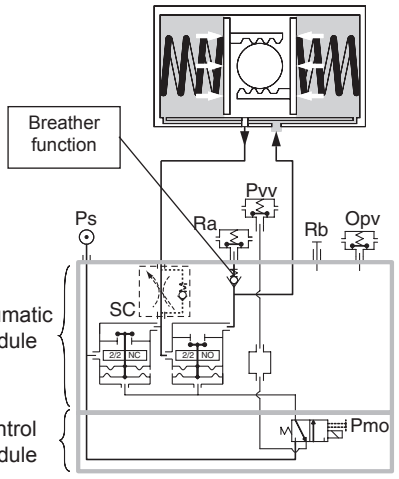
Ps = Pressure supply
Ra = Exhaust
Rb = Exhaust
Pvv = Pilot valve vent
Opv = Over pressure vent

Options:
SC = Speed Control
MC = Manual Control

Double Acting Pneumatic Plan



Single Acting (Spring Return) Pneumatic Plan



Pneumatic Module

Control Module

Speed control configuration (see table below)

As indicated, the throttles can be mounted in the port, for the central air chamber(1) or the end cap air chambers(2).
How the actuator functions depends on

* the action (spring return or double acting)
* the assembly code (Spring to Close or Spring to Open)
* which throttle is applied (One way" or "Two way).

Please see the table below to select the required speed control configuration.

"Opening" or "Closing" stroke

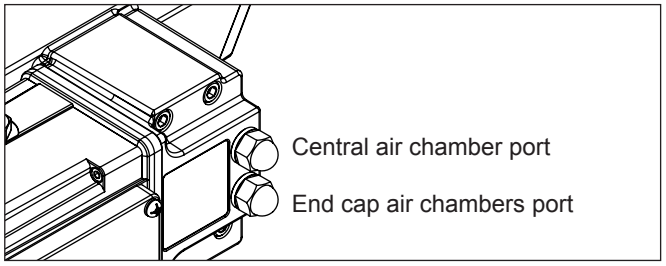
* Whether the speed of the "Opening" or "Closing" stroke is limited, depends on the assembly code of the actuator.

Independently adjusting of the "Opening" or "Closing" stroke speed

* The speed of the "opening" stroke and "closing" stroke on double acting actuators with 2x "One-Way" throttles can be set independently from each other.

Speed control and actuator sizing

Installing a Speed control option can result in a non-smooth operation of the actuator ("Stick - Slip" behaviour). This behaviour can happen when the actuator size is to small for the application. Selecting an actuator 1 size larger will solve this "Stick - Slip" behaviour.



Speed control configuration			Spring return actuators		Double acting actuators	
Option code	**Throttle or Plug**	**in air chamber port**	**Air Fail to Close (Code CW) Standard"**	**Air Fail to Open (Code CC)"**	**(Code CW) Standard**	**(Code CC)**
QP	**Plug**	Central	No Speed Control	No Speed Control	No Speed Control	No Speed Control
	Plug	End cap				
Q1	**"One way SC"**	Central	Clock wise stroke (closing)	Counter Clock wise stroke (opening)	Clock wise stroke (closing)	Counter Clock wise stroke (opening)
	Plug	End cap				
Q2	**"Two way SC"**	Central	Both strokes simultaneously adjustable	Both strokes simultaneously adjustable	Both strokes simultaneously adjustable	Both strokes simultaneously adjustable
	Plug	End cap				
Q3	**"One way SC"**	Central	Not applicable	Not applicable	Both strokes independently adjustable	Both strokes independently adjustable
	"One way SC"	End cap				
Q4	**Plug**	Central	Not applicable	Not applicable	Counter Clock wise stroke (opening)	Clock wise stroke (closing)
	"One way SC"	End cap				

FieldQ valve actuator

Parts and materials Actuator and Modules

Description	Qty.	Description	Specification	Notes
Body	1	Aluminum Alloy	EN AC-AlSi10Mg (Cu)	1/5
Pinion	1	Aluminum Alloy	EN AW 7075 T6	2
Upper pinion part	1	Aluminum Alloy	EN AW 7075 T6	2
Guide band housing	2*	Nylatron	PA6.6 + MoS2	-
Washer pinion	2*	CRMZX100	-	-
Bearing ring	2*	Delrin®	POM	-
Limit stop cam	1	Steel	42CrMo4V	-
Piston	2	Aluminum Alloy	EN AC-AlSi7Mg	6
End cap QS	2	Aluminum Alloy	EN AC-AlSi7Mg	1
End cap QD	2	Aluminum Alloy	EN AC-AlSi7Mg	1
Guide band piston	2*	PTFE, Carbon filled	PTFE + 25% C	-
O-ring piston	2*	Nitrile Rubber	NBR	-
O-ring end cap	2*	Nitrile Rubber	NBR	-
O-ring upper pinion part	1*	Nitrile Rubber	NBR	-
O-ring pinion top	1*	Nitrile Rubber	NBR	-
O-ring pinion bottom	1*	Nitrile Rubber	NBR	-
O-ring B-port	2*	Nitrile Rubber	NBR	-
O-ring retainer bolt	4*	Nitrile Rubber	NBR	-
O-ring limit stop bolt	2*	Nitrile Rubber	NBR	-
Outer spring	2	Carbon Spring Steel	EN 10270-1 SH	3
Middle spring	2	Carbon Spring Steel	EN 10270-1 SH	3
Inner spring	2	Carbon Spring Steel	EN 10270-1 SH	3
Spring retainer	2	Steel	St. DC01 EN10139	4
Washer spring pack	2	Steel	C35	4
Spring pack retainer bolt	2	Stainless Steel	AISI 304 (DIN W nr 1.4301)	-
Washer	4*	Nylon	PA6	-
Nut	4	Stainless Steel	AISI 304 (DIN W nr 1.4301)	-
Nut cover	2	Polyethylene	PE	-
End cap screws	8	Stainless Steel	AISI 304 (DIN W nr 1.4301)	-
Retaining ring pinion large	1*	Carbon Spring Steel	C45, DIN 17200	3
Retaining ring pinion small	1*	Carbon Spring Steel	C45, DIN 17200	3
Limit stop screw	1	Stainless Steel	AISI 304 (DIN W nr 1.4301)	-
Indicator cap	1	Nylon	PA6	-
Indicator arrow	1	Nylon	PA6	-
Indicator insert	1	Nylon	PA6	-
Type plate	1	Stainless Steel	AISI 303 (DIN W nr 1.4305)	-
Hammer drive	1	Stainless Steel	AISI 303 (DIN W nr 1.4305)	-
Insert	1	Aluminum Alloy	EN AW 6082 T5	5

Notes

1 See Corrosion protection below
2 Hard anodized.
3 Deltatone® or Epoxy (black) coating.
4 Zinc plated and passivated.
5 Anodized.
6 Chromatized

Control & Pneumatic Modules

For material specification of the Pneumatic Modules see page 2

Corrosion protection

The applied paint system has passed a 1000 hour salt spray test as detailed by ASTM B117. For a detailed description of the Corrosion protection system see data sheet 1.606.05.

Temperature ranges

The temperature range of FieldQ actuators with NAMUR plates depends on the O-ring seals and the utilized grease.
For a detailed description of posible temperature ranges and applied parts, see data sheet 1.605.03

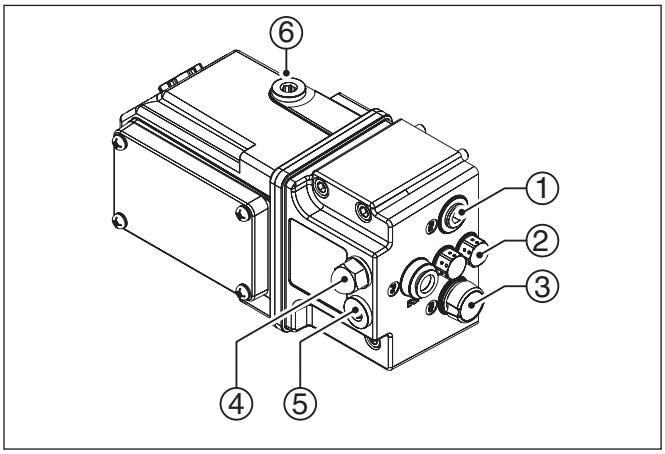
Repair kit

Parts marked with an * are included in the repair kit

FieldQ valve actuator

Parts and materials Actuator and Modules

Modules QC01, 02, 03, 04
QC11, QC12, QC13, QC14
QC30, QC31 and QC34



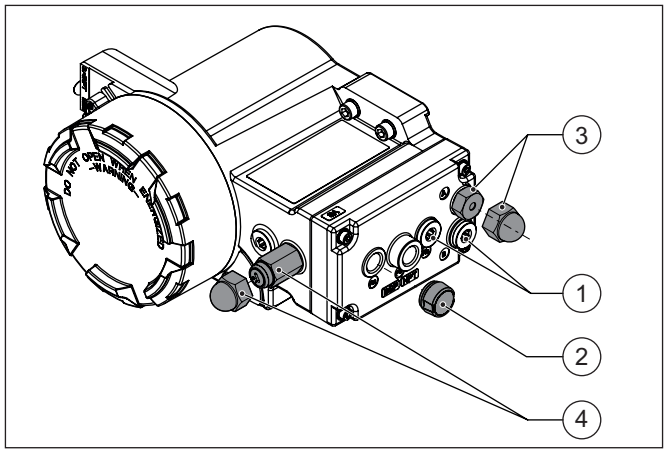
Base Materials

Body:	Aluminium
Valve housing:	30% glass-filled Nylon
Finish:	Polyester non-TGIC based powder coating
Valve seats:	Buna-N
Membrane:	Buna-N
Fasteners:	Stainless Steel

External parts

1	Plug	NPT:	Steel, zinc plated
		BSP:	Brass, nickel plated
2	Vents:		Stainless Steel (AISI 303)
3	Exhaust	Base:	Nylon
		Cover:	Zinc Nickel plated and transparent passivated
		Option:	Plastic silencer (nylon)
4	Speed Control:		
	- Throttle:		Stainless Steel (AISI 303)
	- Nut Cover: Nylon		PA6
5	Plug:		Brass Nickel plated
6	Manual Control:		
	- Plug:		Brass Nickel plated
	- Push:		Red anodized aluminum
	- Push & Lock:		Red anodized aluminum

Modules QC41, QC42, QC43



Base Materials

Bodies:	Aluminium
Finish:	2 Component with an epoxy primer and polyurethane enamel top coating.
Pneumatic cartridge:	Aluminium
Valve seats	NBR
Pilot valve cartridge:	Housing: Nylon PA6
Switch cartridge:	Housing: Nylon PA6
Fasteners	Stainless Steel

External parts

1	Plug	NPT:	Steel, Nickel plated
2	Exhaust	Base :	Nylon PA6
		Cover:	Zinc, Nickel plated and transparent passivated
		Option:	Plastic silencer (nylon)
3	Speed Control:		Stainless Steel (AISI 303)
4	Manual Control:		Red anodized aluminum
5	Nut Covers: Nylon PA6		

FieldQ valve actuator

Corrosion protection system

Description:

The corrosion protection system of FieldQ pneumatic valve actuators consist of the following treatments or materials:

1 Pretreatment

The actuator housings are anodized inside and outside, to give them a durable and superb protection against wear and corrosion.
The anodized base layer, takes care of excellent bonding between the aluminum surface and the coating.
Additionally the pistons are chromatized to prevent the corrosion of the internals.

2 De-greasing

All aluminum parts are de-greased before the powder coating is applied by washing with an alkaline solution to assure the best bonding between the aluminum surface and the coating.

3 Powder coating

- Polyester non-TGIC based powder coating for exterior use.
- The powder coating is applied cold using automatic electrostatic spray equipment and is cured at minimum 190°C (374°F) offering excellent light and weather resistance.
- The powder coating thickness is 80 micrometer (3.1 mils).
- Good chemical resistance against most bases, acids, solvents, alkalis and oils at normal temperatures.
- Excellent exterior mechanical durability.
- The coating shows no decline of actuator functions after 1000 hours salt spray test.
- The powder coating is virtually solvent free, and therefore environmentally friendly.

4 High grade & hard anodized aluminum pinion

Actuators with high grade & hard anodized aluminum pinions, passed a 1000 hours salt spray test.

5 Stainless steel or Deltatone® treated external steel parts.

External parts are stainless steel or steel alloy with a Deltatone® treatment

6 Corrosion protected springs on Spring Return actuators

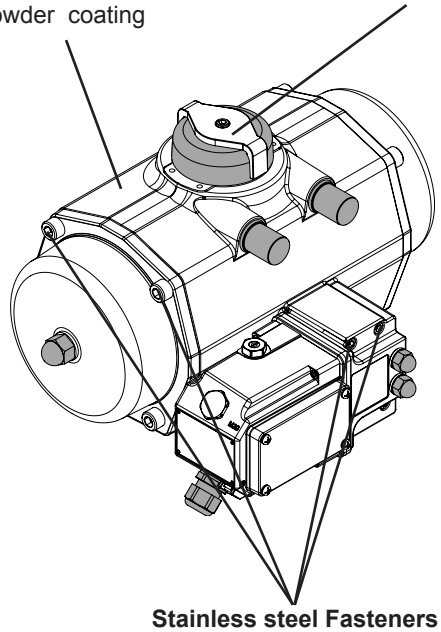
All the springs of spring return actuator are Deltatone® or epoxy (black) coated to prevent the corrosion of the springs and assure a long cycle life.

Technical data:

Coating	: Polyester non-TGIC based powder coating	
Thickness	: 80 to 160 micrometer (3.1 to 6.2 mils).	
Salt spray test	: 1000h (DIN 50021 / ASTM B117)	
Color	: Yellow	
Materials	: Housing	: Anodized aluminium alloy
	: Pistons	: Chromatized
	: Pinion	: High grade aluminum alloy, hard anodized
	: Fasteners	: Stainless steel or alloy steel with Deltatone treatment
	: Tag plate	: Stainless steel

Housing:
Anodized aluminium alloy, polyester non-TGIC based powder coating

Pinion:
High grade aluminum alloy, hard anodized



Stainless steel Fasteners

FieldQ valve actuator

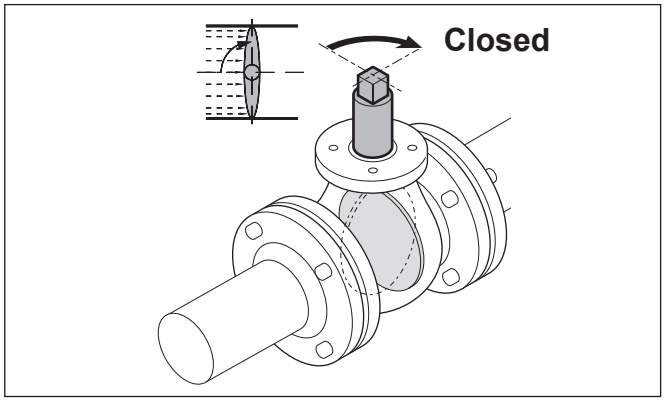
Failure modes

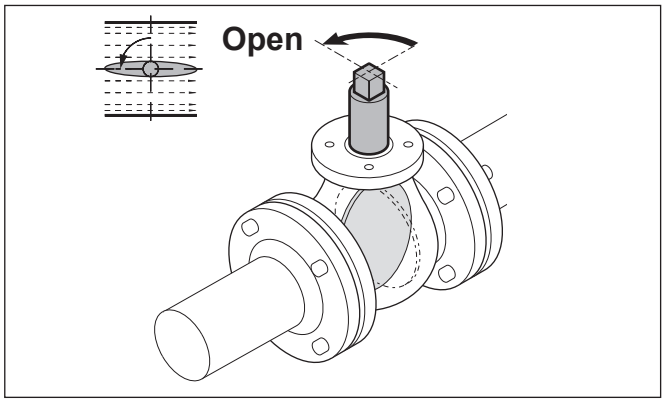
Valve rotation

Valves are normally manufactured so that:

1 The valve is closed : after a clock wise rotation*
2 The valve is open : after a counter clock wise rotation*

*) = views from above





Position after a failure

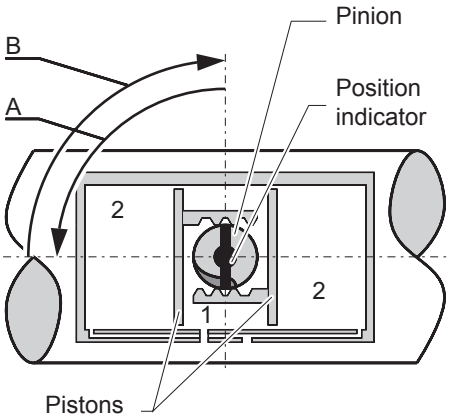
The position of the actuator after a failure depends on:
1 Principles of operation
Spring Return or Double Acting
2 Actuator assembly code
See 1.606.03 for Double Acting
See 1.606.04 for Spring Return
3 Kind of failure See table.

Principle of operation:	Assembly code :	Kind of failure :	Position :
Double acting actuator	CW	Pressure	not defined
		Signal	Closed
		Supply voltage	Closed
	CC	Pressure	not defined
		Signal	Open
		Supply voltage	Open
Single acting actuator (Spring Return)	CW	Pressure	Closed
		Signal	Closed
		Supply voltage	Closed
	CC	Pressure	Open
		Signal	Open
		Supply voltage	Open

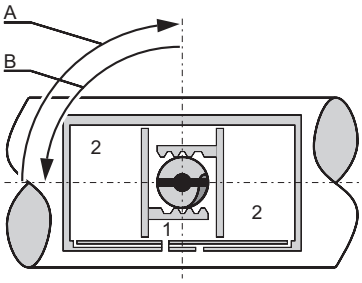
Actuator assembly codes

Double acting assembly codes

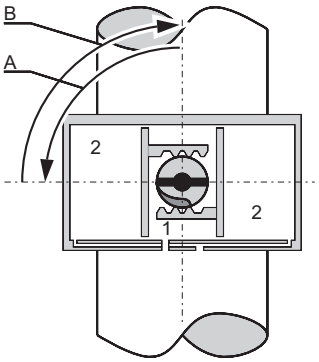
Standard assembly code: (= **Clock Wise** Rotation)	**CW**
Visual indicator mounted: (= for In line position indication	**I**



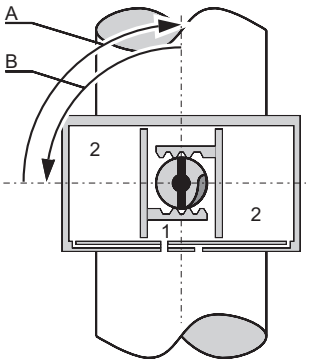
Optional assembly code: (= **Counter Clock Wise** Rotation)	**CC**
Visual indicator mounted: (= for In line position indication	**I**



Optional assembly code: (= **Clock Wise** Rotation)	**CW**
Visual indicator mounted: (= for Cross line position indication	**C**



Optional assembly code: (= **Counter Clock Wise** Rotation)	**CC**
Visual indicator mounted: (= for Cross line position indication	**C**



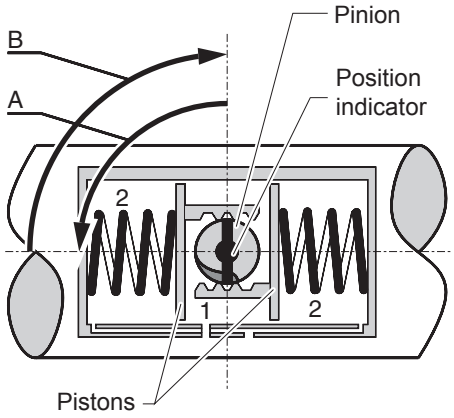
A = Pilot valve operated in Control Module - Central air chamber (1) pressurized
B = Pilot valve not operated in Control Module - End cap air chambers (2) pressurized

All views are from above. Pistons are shown in inner position

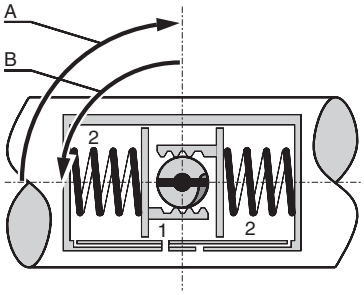
Actuator assembly codes

Single acting (Spring Return) assembly codes

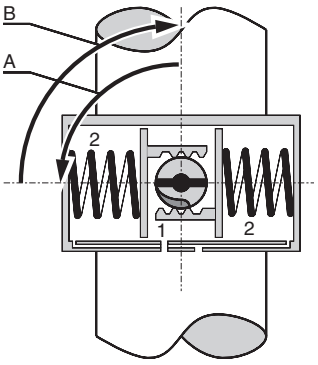
Standard assembly code: (= Clock Wise Rotation / Spring to Close)	**CW**
Visual indicator mounted: (= for In line position indication	**I**



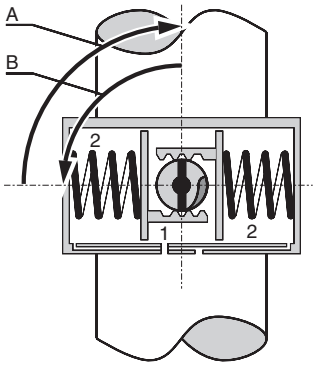
Optional assembly code: (= **Counter Clock Wise** Rotation/ Spring to Open)	**CC**
Visual indicator mounted: (= for In line position indication	**I**



Optional assembly code: (= **Clock Wise** Rotation / Spring to Close)	**CW**
Visual indicator mounted: (= for Cross line position indication	**C**



Optional assembly code: (= **Counter Clock Wise** Rotation/ Spring to Open)	**CC**
Visual indicator mounted: (= for Cross line position indication	**C**



A = **Pilot valve operated** in Control Module - Central air chamber (1) pressurized
B = **Pilot valve not operated** in Control Module - **Spring stroke (2)**

All views are from above. Pistons are shown in inner position

World Area Configuration Centers (WACC) offer sales support, service, inventory and commissioning to our global customers. Choose the WACC or sales office nearest you:

NORTH & SOUTH AMERICA

19200 Northwest Freeway
Houston, TX 77065
T +1 281 477 4100
F +1 281 477 2809

Av. Hollingsworth,
325, Iporanga Sorocaba,
SP 18087-105
Brazil
T +55 15 3238 3788
F +55 15 3228 3300

ASIA PACIFIC

No. 9 Gul Road
#01-02 Singapore 629361
T +65 6501 4600
F +65 6268 0028

No.1 Lai Yuan Road
Wuqing Development Area
Tianjin 301700
P.R.China
T +86 22 8212 3300
F +86 22 8212 3308

MIDDLE EAST & AFRICA

P. O. Box 17033
Dubai
United Arab Emirates
T +971 4 811 8100
F +971 4 886 5465

P. O. Box 10305
Jubail 31961
Saudi Arabia
T +966 3 340 8650
F +966 3 340 8790

24 Angus Crescent
Longmeadow Business Estate
East P.O. Box 6908;
Greenstone; 1616
Modderfontein, Extension 5
South Africa
T +27 11 451 3700
F +27 11 451 3800

EUROPE

Asveldweg 11
7556 BR Hengelo (O)
The Netherlands
T +31 74 256 1010
F +31 74 291 0938

For complete list of sales and manufacturing sites, please visit **www.emersonprocess.com/valveautomationlocations**
Or contact us at **info.valveautomation@emerson.com**

www.emersonprocess.com/fieldq

EMERSON™
Process Management