

# FieldQ™ Pneumatic actuators and controls

The Fully Integrated solution



# What is the true cost of your Valve Automation solutions?

*“20% reduction in installation & commissioning time”*

*“Integrated plug & play modules eliminate common failure points and significantly reduce maintenance time”*

*“Small package size enables retrofit in existing pipelines”*

## **Initial purchase price does not reflect the true cost**

As one of the largest worldwide suppliers of valve automation solutions, Emerson Process Management understands the needs of today’s actuator and controls buyer.

Features and benefits are important, but what is even more important is the value that these benefits bring to the organization. Cost is important too but looking at initial purchase price does not show the true picture.



Costs are accumulated throughout the whole lifecycle of the project; i.e. before a purchasing decision is made through to mounting on the valve, installation and commissioning and on-going maintenance too.





### One call, that's all

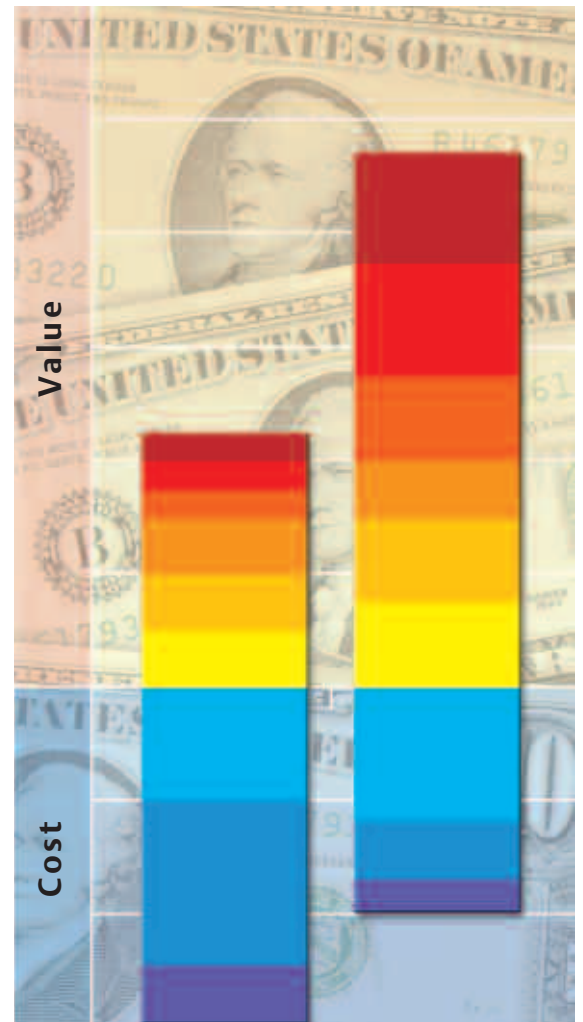
With our extensive distributor network; our knowledgeable sales and support teams; configuration and service centers and broad product portfolio – containing many of the world's best known actuator brands – Emerson Process Management is ideally placed as the supplier of choice for your valve automation needs. No longer do you need to call many different suppliers to get all the different sizes of actuators you need, as well as all the different accessories. One call will get you the complete range of solutions you require, saving time and money.

### Fully integrated solution brings additional value

The innovative FieldQ pneumatic actuator is just one of these solutions. The easy to use, intelligent solution

has simplified the automation of rotary valves significantly, bringing an unprecedented level of value to users. Integrated accessories remove the need to specify and procure these items separately, reducing purchasing time. These same integrated accessories reduce installation costs while the push button calibration reduces commissioning time. Device diagnostics enable a move to predictive maintenance – a proven lower cost means of performing maintenance – and the modular design simplifies maintenance and upgrades.

The FieldQ pneumatic actuator can bring a value to your organization that is far greater than other actuators can, and for a price that is lower than you think. To find out more, read on.



	Competitor	FieldQ
	Difficult to maintain and upgrade	Easy to maintain and upgrade
	Limited diagnostics	Enhanced diagnostics
	Takes time to commission	Virtually eliminates commissioning time
	Larger size prevents compact mounting	Small package enables compact mounting
	Bracket mounted	Direct mounted
	Competitor brand	Emerson brand quality and reliability
	Costly to specify and procure	Reduction in total installed cost
	Multiple vendor sourcing	Single vendor sourcing
	Costly inventory and inventory management	Reduction in total inventory and inventory administration



# From specification to operation

**“Single vendor sourcing cuts administration costs by up to 50%”**

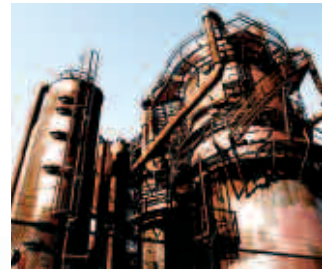
**“Direct mounting enables 15% savings in labor, materials and time”**

**“Auto initialization module could save one man / week on a 100 actuator project”**

## **Simplified specification and purchasing**

The costs of specifying and procuring a valve automation solution begin even before an enquiry is raised. Specifications must be drawn up, checked and approved and passed to purchasing. Often the engineers raising the specifications rely on support from suppliers and distributors, the more suppliers they deal with the longer this process may take and the more costly it will be. A similar problem is faced by the person making the purchase. Many suppliers do not offer a complete range of sizes, so if purchasing solutions for a wide range of valves then different suppliers will need to be contacted. Each enquiry and each purchase order has a cost associated with it so the more suppliers you deal with the greater the cost. Similarly, purchasing the control accessories separately has a cost associated with it too.

Because Emerson offers a broad range of actuator solutions it is not necessary to source from multiple suppliers. In addition, the integrated control accessories of the FieldQ product remove the need to source these accessories from additional companies. Both these facts reduce the overall procurement costs.





## Easy mounting and commissioning

Before FieldQ, it was often necessary to assemble accessories to the actuator prior to mounting to the valve. The result was that there was no, single supplier responsible for the complete assembly. This meant that there were sometimes compatibility or set up issues. Even if the whole assembly was purchased from one supplier, ready mounted and piped, some of these issues still persisted.

The FieldQ pre-engineered "PLUG AND PLAY" solution eliminates these issues and enables smoother, easier

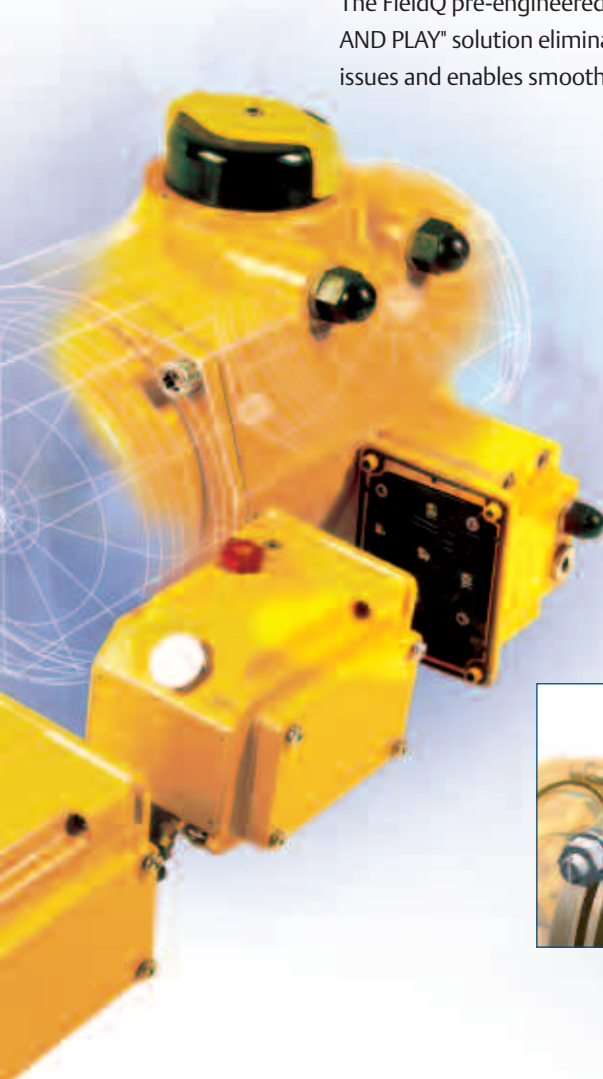
start-up. Engineering complexity is reduced by integrating control and feedback with the basic actuator and the modular design enables accessories to be added simply and without risk.

Double drilling patterns are available for almost all actuators and a range of inserts, enabling the actuator to be directly mounted to suitable valves. This eliminates the need for a bracket and coupling type mounting kit. The use of a direct mount configuration significantly cuts the cost of the valve/actuator assembly and reduces the assembly package size.

Standard actuators are fitted with square drive inserts in accordance with ISO 5211 or DIN3337, but a variety of other inserts are also available. Special inserts have oversize or undersize squares, with double-D or round shaft and key forms.

Where direct mounts are not possible - as on valves with exposed gland packing - the use of inserts simplifies the design of the mounting kit.

Dual Stroke Adjustment enables precise set-up of both valve end-positions and Push-button auto initialization enables easy and fast commissioning.



## Reliable Operations

FieldQ adds value to plant operators too. The patented Intelligent Position Tracking (IPT) technology provides accurate and reliable position information continuously through the operating stroke, this enables improved process control. A large visual position indicator shows valve position at a glance. The innovative poppet valve design, together with the use of static seals, allows the use of standard factory air, saving costs for air filtration. But most importantly, FieldQ provides a reliable, long working life.

# Reliability, predictive diagnostics and easy maintenance

***“What is the cost of downtime in your plant?”***

***“Proven reliability you would expect from Emerson”***

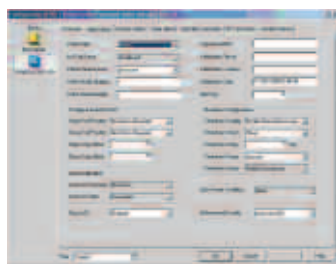
***“Fully integrated accessories eliminate common failure points”***

***“Predictive diagnostics prevent unplanned downtime”***

***“Plug-and-play functionality enables speedy repair and upgrades”***

## **Proven reliability**

Based on proven technology – with an installed base of over two million units – and designed for superior and safe performance over time, FieldQ has been subjected to over 1 million open/close cycles. The balanced pinion design uses seals with low surface pressure and low wear, effectively reducing the maintenance requirements.



The large diaphragm poppet design ensures reliable opening and closing, even at sub-zero temperatures where moisture in the air has the potential to freeze and block other pilot valve designs. The revolutionary design enables the use of a low power pilot valve, while still maintaining a fast response time.

## **Corrosion resistance increases service life**

An integrated breather function provides protection of the actuator spring chamber from any corrosive elements in the atmosphere being sucked into the actuator during the return stroke, preventing spring corrosion. Anodized internals and a corrosion resistant polyester powder coat finish ensure long-term reliability in aggressive atmospheres, exceeding a 1000 hour salt spray test (ASTM B117).

Many failures are caused by external damage. By housing all the controls internally within the robust FieldQ unit, no vulnerable parts are exposed. The enclosure is rated to IP65 and NEMA 4X, while variations for hazardous areas are available that are certified to meet ATEX, CSA and FM requirements. For easy installation and commissioning, the Control Module can be pre-wired to provide a quick connection. FOUNDATION Fieldbus™ modules can be initialized digitally by the bus system. Together with quick connectors this eliminates the requirement to open the Control Module for wiring and initializing. This also saves time ensuring that the Control Module interior is kept clean.



**Predictive diagnostics minimize downtime**

The process industry is facing demands for improved safety, plant availability and process control. This is driving the need for more and better process information. Accurate and timely information is key to addressing these challenges yet few pneumatic rack and pinion actuators are capable of providing the enhanced diagnostic information needed. FieldQ is just the latest of Emerson's intelligent field devices that are key elements of PlantWeb digital plant architecture. FieldQ offers exciting possibilities for device diagnostics via FOUNDATION Fieldbus™ and Profibus, in addition to the more basic functions offered by AS-i. bus

As downtime is very expensive (costs could exceed \$100,000 per hour for a chemical or pharmaceutical plant), Emerson recognizes the need to keep plants running for as long as possible and the important role that predictive maintenance plays to achieve that goal. Diagnostics information is essential in enabling this move towards predictive maintenance.

Imagine the benefit to you in knowing "in advance" when a final control element will be in need of repair and, if it does need repair, what will need to be repaired. Running

diagnostics on valves equipped with FieldQ Pneumatic Valve Actuators enables you to make sound, predictive maintenance decisions.

### Alerts provide immediate feedback

Diagnostic alerts can signal implied or actual problems with the final control element. These alerts can be continuously scanned, providing immediate feedback to operations while the valve is still controlling the process.

FieldQ powers PlantWeb® by capturing diagnostic data from all the components of the final control element and delivering it to the easy to use interface of AMS Suite: Intelligent Device Manager software. This enables the user to configure, calibrate, monitor, perform diagnostics and maintain records



for virtually any FieldQ equipped valve in the plant, all from a single central location. Diagnostics provided include:

- Travel times
- Cycle counts
- Time in position
- Various internal electronic health tests
- Module temperature
- PlantWeb® Alerts

The FieldQ pneumatic valve actuator has been tested by the Fieldbus FOUNDATION and is registered as having passed the latest interoperability test of the FOUNDATION. FieldQ contains one Discrete Output (DO), two Discrete Input (DI) and two Analogue Input (AI) for ON-OFF applications. The function blocks can be assigned to various parameters including position, temperature, and control, to name a few.

### Cost-effective maintenance

The compact modular design of FieldQ comes into its own if maintenance is required. If a Control Module, or one of the accessories fails the plug-and-play functionality enables a quick change out. In addition, upgrades - such as a change to the communications protocol, or backwards integration by adding Namur solenoid valves or switches - can be easily undertaken by changing or adding modules.

# Designed to add value

FieldQ actuators are suitable for use in SIL3 applications where a periodic partial stroke test is performed. Where partial stroke testing is not required the FieldQ actuators are suitable for use in SIL2 applications.

## Springs

FieldQ springs are designed and manufactured never to break and are protected from corrosion using a Deltatone® coating.

## Control Module

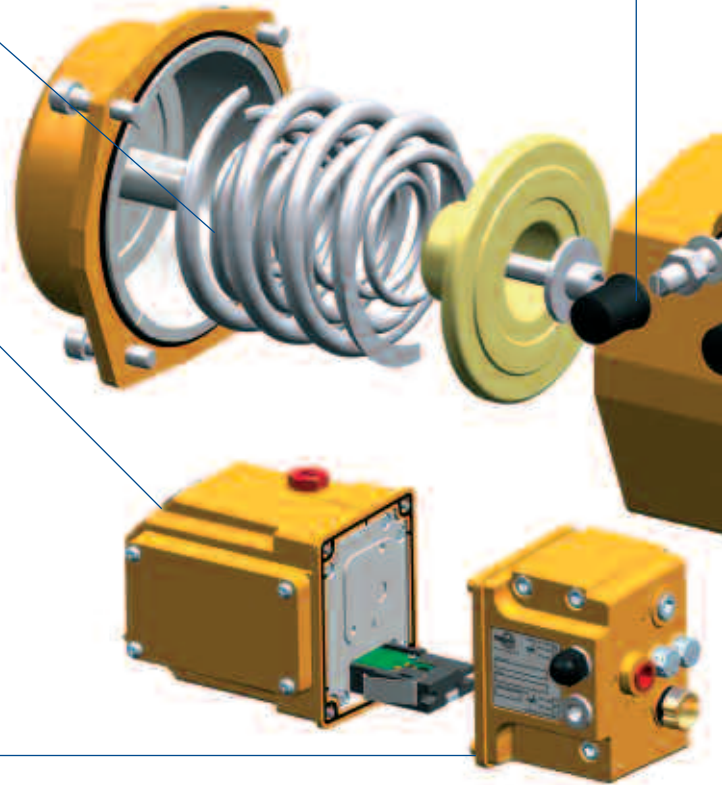
Control Modules provide the flexibility to select the right functionality for your application. This modular system provides the possibility to upgrade to digital communications as well as enable the fitment of a local manual control and a variety of glands and quick connectors.

## Pneumatic Module

The patented, reliable diaphragm/poppet design offers a high air volume capacity without the need for filtered air required by conventional spool or solenoid valves. Most importantly however it provides a reliable, long working life. A breather function, standard on single acting versions provides protection of the actuator spring chamber in applications where the actuator is located in an aggressive corrosive atmosphere. As an option the Pneumatic Module can be equipped with a speed control.

## Dual Stroke Limit Stops

FieldQ actuators are factory set on a rotational travel of  $90^{\circ} \pm 0.5^{\circ}$ . Two limit stops are available as standard to adjust either the open and/or closed position. With the dual stroke limit stops, a wide variety of valve applications, like metal seated or high performance valves, can be adjusted accurately to their specific requirements.



## Intelligent Position Tracking Device

IPT technology™ allows the integration of controls and feedback in a single product - providing continuous position tracking, with contactless position sensing and feedback. A separate switch box, found on other actuators, has been replaced by an integrated sensor on the pinion. This continuously monitors movement and communicates feedback to the Control Module and back to the control room, as required.



### Pinion

Precision-machined anti-blow-out pinion is made of high duty aluminum alloy and hard anodized for optimum performance and durability. Three part pinion design is balanced, reducing pressure forces on the pinion thrust, radial bearings and the O-ring seals. This ensures low maintenance requirements in high cycle applications. Seals are designed to minimize crevices, providing maximum protection against corrosion. The Delrin radial bearing on the pinion bottom is made as wide as possible to minimize friction and ensure a durable and smooth operation.

### Limit Stop Cam

The large diameter, high tensile steel, limit stop cam ensures accurate and lasting stroke adjustment.

### Body

Superior materials and coatings provide optimum strength and corrosion resistance, ensuring long service life and minimal maintenance through corrosion issues.

### Piston

The large piston rack is precision-machined and chromated for optimum performance and lasting durability. Nitrile rubber O-ring seals and the 3 point guiding system ensure a durable, air tight and smooth operation.

### Spring Package

Single acting actuators up to size Q350 have spring packages for safe and easy disassembly, requiring only standard Allen keys.

### End Cap

End caps on double acting versions are flat, reducing overall length.

### End Cap Screws

All external fasteners are stainless steel to ensure a long lasting, air tight and safe operation.

### Housing Guide Band

Wide Nylatron® guide band provides wear protection between housing and piston, extending actuator life in the most severe and demanding conditions.

### Valve Flange

FieldQ actuators are all provided with valve flanges according to ISO 5211. Most sizes have two drilling patterns and together with the insert provide a low cost and versatile direct valve mounting. For mounting according to DIN3337 the glass filled nylon centre plate is added to the actuators flange, providing additional location of the actuator to the mounting bracket.

# Emerson Process Management

*“Emerson is the market leader in Process Automation”*

*“Multiple valve automation solutions are available from Emerson Valve Automation”*

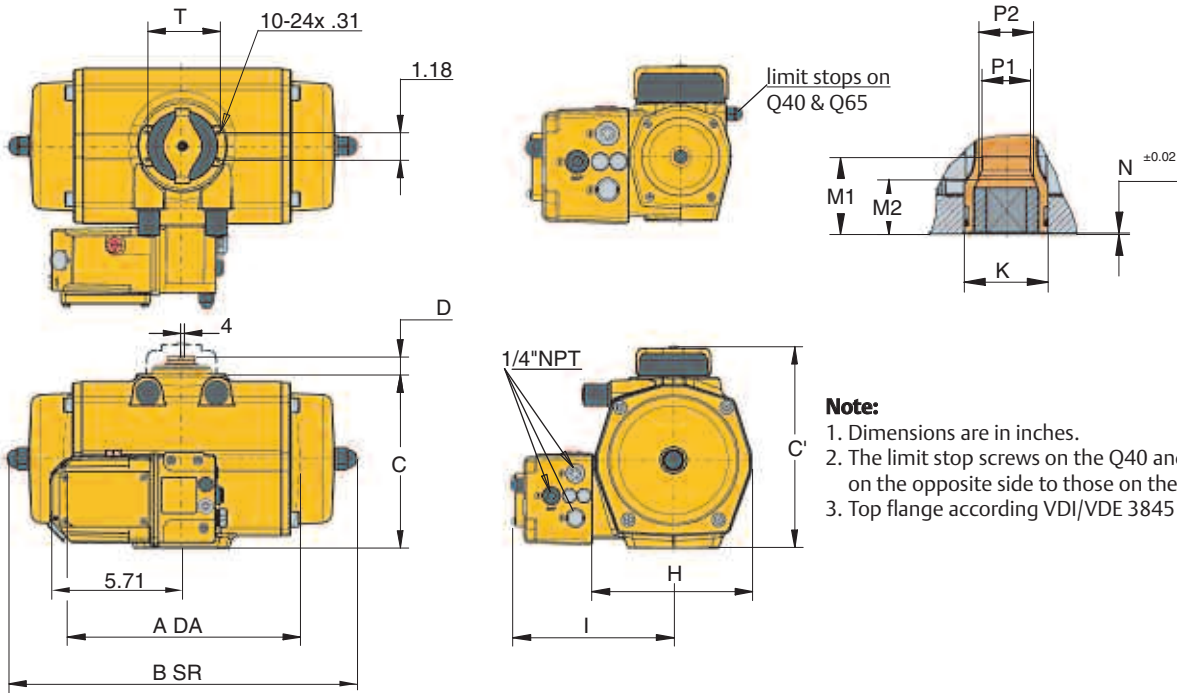
The **FieldQ pneumatic actuator** is available as part of a total automation solution, from a range of different distribution channels as well as direct from Emerson Valve Automation sales staff. Working from regional valve automation centers, the sales staff, alongside their service and support colleagues, are able to provide unparalleled levels of support no matter where in the world you are based.



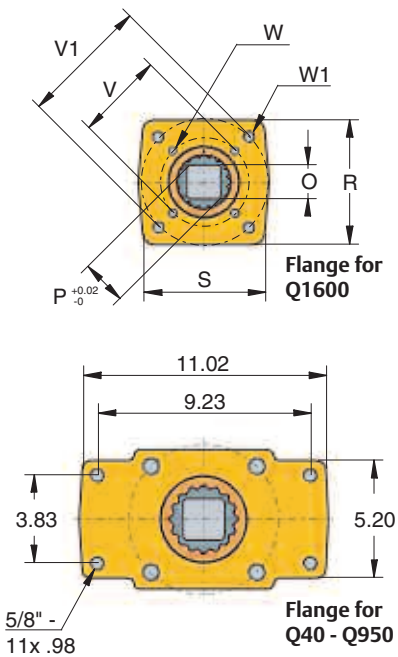
Emerson's **Valve Automation** division consolidates the company's vast array of products and services, offering world leading pneumatic, hydraulic, electric and gas-hydraulic valve automation products and services. The division focuses on providing these products and services to complement Emerson's extensive capabilities in automation solutions for the process industries.



# Dimensions



**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)



\*) Four holes of the F25 ISO Drilling pattern

FieldQ™ actuator models

	Q40	Q65	Q100	Q150	Q200	Q 350	Q600	Q950	Q1600
<b>A QD</b>	180	199	221	310	283	305	387	424	516
<b>B QS</b>	204	249	267	211	346	387	416	460	568
<b>C</b>	104	117	141	150	161	191	245	276	337
<b>C'</b>	137	150	175	184	194	225	289	319	380
<b>D</b>	20	20	20	20	20	20	30	30	30
<b>H</b>	86	102	108	130	128	173	207	231	265
<b>I</b>	128	142	141	158	149	171	187	200	217
<b>K</b>	33	33	38	55	55	55	68	75	95
<b>M1</b>	34.5	34.5	34.5	50	50	50	52	64	82
<b>M2</b>	-	-	27	-	37	37	-	-	-
<b>N</b>	1	1	1.5	1	1.5	1.5	1.5	1.5	1.5
<b>O max.</b>	14.11	14.11	19.13	19.13	22.13	27.13	27.13	36.16	46.16
<b>O min.</b>	14.00	14.00	19.00	19.00	22.00	27.00	27.00	36.00	46.00
<b>P</b>	18.1	18.1	25.2	25.2	28.2	36.2	36.2	48.2	60.2
<b>P1</b>	18.1	21.2	23.5	28.5	32.1	32.1	36.5	48.5	60.5
<b>P2</b>	-	-	25.2	-	36.2	36.2	-	-	-
<b>R</b>	65	70	70	90	90	114	124	130	154
<b>S</b>	65	70	70	90	90	114	124	142	280
<b>S</b>	80	80	80	80	80	80	130	130	130
<b>PCD</b>	F05/F07	F05/F07	F05/F07	F07/F10	F07/F10	F07/F10	F10/F12	F10/F14	F16/F25*
<b>V</b>	50	50	50	70	70	70	102	102	165
<b>V1</b>	70	70	70	102	102	102	125	140	-
<b>W</b>	M6x 10	M6x 10	M6x 10	M8x 13	M8x 13	M8x 13	M10x 16	M10x 16	M20x 30
<b>W1</b>	M8x 13	M8x 13	M8x 13	M10x 16	M10x 16	M10x 16	M12x 20	M16x 25	-

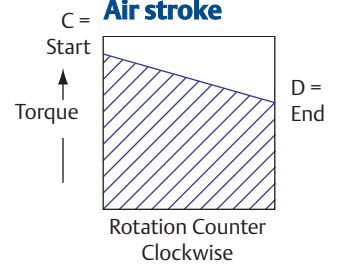
# FieldQ Torque Values

## Spring Return

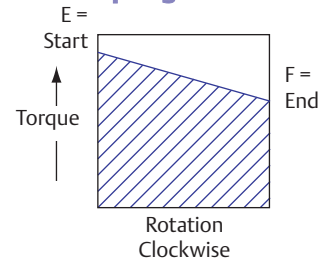
Spring set Actuator Size	nr.	Air Torque (Nm)																Spring Torque (Nm)	
		Supply pressure (bar g)																	
		3		3.5		4		4.5		5		5.5		6		7		E	F
QS 40	2	17	11	22	16	26	21	31	25	35	30	40	34	44	39	53	48	13	8
	3	12	4	17	8	21	13	26	17	31	22	35	27	40	31	49	40	20	12
	4	-	-	12	1	17	5	21	10	26	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
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	62	39	78	56	94	72	111	88	127	105	143	121	159	137	192	170	50	30
	3	44	11	60	27	77	44	93	60	109	76	126	93	142	109	175	141	74	45
	4	-	-	-	-	59	15	76	31	92	48	108	64	125	80	157	113	99	61
	5	-	-	-	-	-	-	58	3	75	19	91	35	107	52	140	84	124	76
	6	-	-	-	-	-	-	-	-	-	-	73	7	90	23	122	56	149	91
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

### Air stroke



### Spring stroke



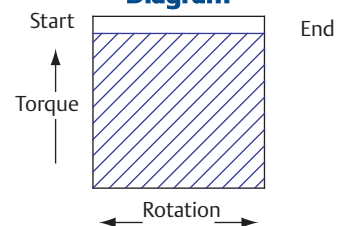
[www.FieldQ.com](http://www.FieldQ.com)

The actuator data presented in this brochure is only amount of all the data available. Please check the download section of [www.FieldQ.com](http://www.FieldQ.com) for more product information or contact your nearest FieldQ representative.

## Double Acting

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

## Double Acting Torque Diagram





**PlantWeb** is Emerson's proven digital plant architecture that uses the power of predictive intelligence to improve plant performance. FieldQ pneumatic actuators play an important role in the PlantWeb architecture. While PlantWeb lowers capital and engineering costs compared to traditional DCS-centered architectures, it provides even greater operational benefits by enabling you to improve throughput, availability, and quality, reduce conversion costs, and sustain the resulting performance gains. Users typically report at least 2% improvements in plant efficiency.



**Emerson Process Management**, one of the Emerson family of companies, is a leading global supplier of products, services, and solutions that measure, analyze, control, automate, and improve process-related operations. Offerings include best-in-class measurement, analytical, and control products; the innovative PlantWeb® architecture, which uses digital technology to improve process and business results; and a broad array of engineering, consulting, maintenance, and project management services.

**Emerson** is a global company that brings together technology and engineering to provide innovative solutions for our customers in a wide range of industrial, commercial, and consumer markets. Our priority is to design, produce and deliver products, systems, and solutions that make people's lives better.

# FieldQ Applications



FieldQ can match the required sophistication of your application at any level. Developed to address the increasing customer demand for valve automation systems with integrated control accessories and digital communication possibilities, FieldQ is equally at home in conventional or bus communication applications. The introduction of FieldQ provides customers with an integrated, modular, cost-effective and

intelligent pneumatic valve automation package that is suitable for:

- Hazardous areas
- Applications where position sensing and feedback are required
- Applications that have a need for diagnostics and/or digital communications
- Installations requiring a very compact package

This intelligent solution is capable of meeting the tough demands of both the chemical and pharmaceutical industries, where reliability and high performance standards are critical. The highest attention to quality of design and manufacture ensures that the FieldQ can withstand temperature extremes, harsh duty and corrosive atmospheres.

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