
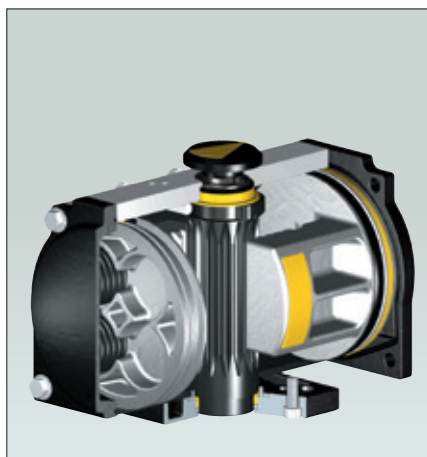
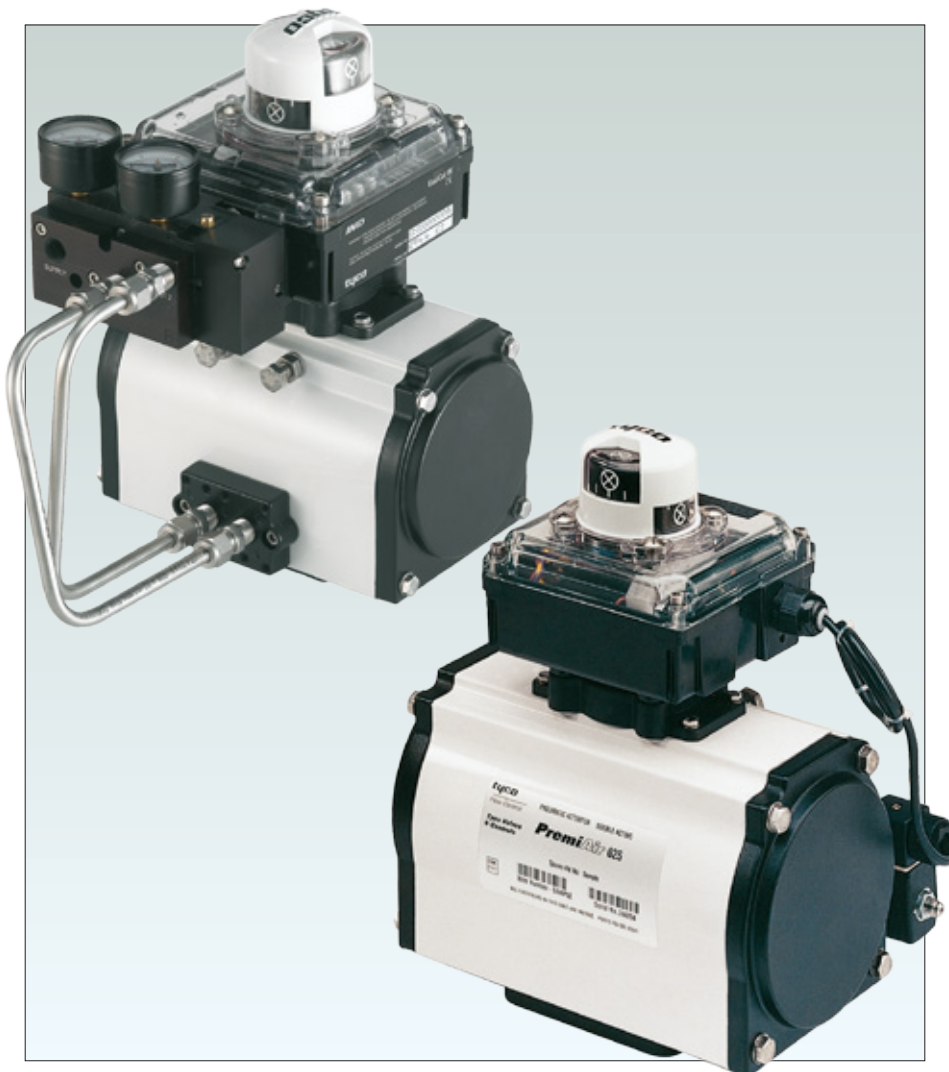


## KEYSTONE

**A comprehensive range of pneumatic actuators, conforming to EN ISO 5211, providing compact, reliable and economical powered operation for all types of quarter turn valves.**

### Features

- Mounting to valve either directly or via bracket, using a detachable mounting plate.
- Conforming to European and International Standard EN ISO 5211, preferred dimensions.
- Double Rack & Pinion design.
- Double Acting or Spring Return models utilise the same compact body design.
- Aluminium body, hard anodized externally and internally, for corrosion and wear resistance.
- Adjustable travel stops.
- Safe end cover bolting requiring no special tools.
- Anti blow-out drive pinion.
- Air connection plate is detachable and replaceable.
- Parallel and diagonal, double square (star) drive.
- Over travel adjustment (at each end)  $\pm 5^\circ$ .
- Under travel adjustment (at each end)  $\pm 10^\circ$ .
- Increased under travel is available on request.
- Easy field conversion between DA and SR models.
- ATEX certified  II 2 G D.



### Technical Specifications

Torque output range	- Double acting	27 - 2054 Nm (5.5 bar g)
	- Spring return	11 - 902 Nm spring end torque (5.5 bar rating)
Operating medium	- Air (dry or lubricated)	
Travel adjustment	- Over travel (at each end) $\pm 5^\circ$ . Under travel (at each end) $\pm 10^\circ$ .	
	Increased under travel is available, on request.	
Temperature range	- Standard	-30°C to +90°C
	- High temp	-30°C to +120°C
Air supply pressure	- PremiAir actuators are rated for air pressure in the range 2.75 barg (40 psig) to 8.3 barg (120 psig) and will withstand a maximum of 10.3 barg (150 psig)	

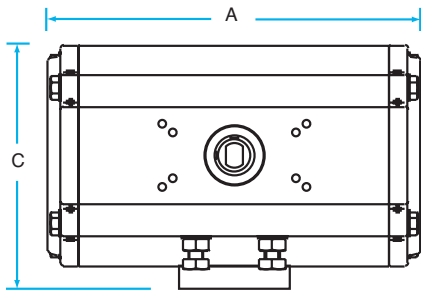
### Mounting Specifications

Actuator to valve	- Mounting standard EN ISO 5211 (preferred)
Pinion drive	- Parallel or Diagonal Square Head, EN ISO 5211 (preferred)
Accessories	- NAMUR VDI/VDE 3845

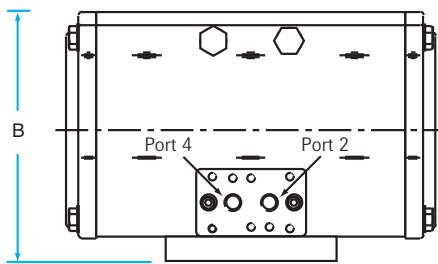
# PremiAir Pneumatic Actuators

## Dimensions (mm)

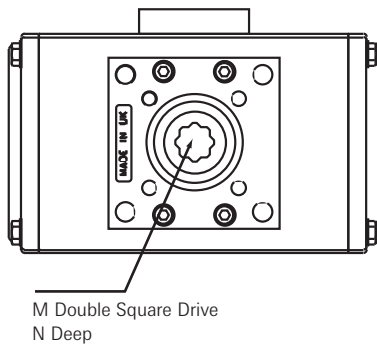
Top view



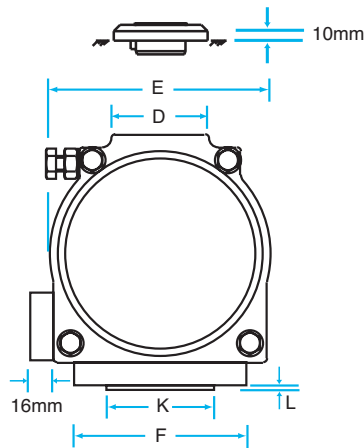
Side view



Bottom view



Front view



### Notes

**Note 1**

For size 180 only, spring return model has an extended body, due to the addition of spring packs. Dimension 'A' is then 694.

**Note 2**

Size 180 incorporates a (single) square drive at 45 degrees.

### Actuator dimensions (mm)

Actuator Size	A	B	C	D	E	Double Sq. drive (2)			Flange type	Hole details (Actuator to valve)
						F	M	N		
002	155.8	83.4	86.8	56.8	70.8	67	14	16	F05	4xM6x9dp
004	172	93.5	93	63.5	77	75	14	16	F05/F07	4xM6x9dp & 4xM8x12dp
009	194.75	122	122	63.5	106	80	17	20	F05/F07	4xM6x9dp & 4xM8x12dp
014	206	138	132.5	63.5	116.5	80	17	20	F07	4xM8x12dp
025	242	163.5	157.25	63.5	139	112	22	24	F07/F10	4xM8x12dp & 4xM10x15dp
037	285	184.5	173.95	72.3	163.5	116	27	30	F10/F12	4xM10x15dp & 4xM12x18dp
045	333.5	200	185.8	75	174.6	116	27	30	F10/F12	4xM10x15dp & 4xM12x18dp
070	394	230	216.6	88.9	205	127	27	30	F10/F12	4xM10x15dp & 4xM12x18dp
088	417.5	254	234.75	98	221.5	150	36	38	F10/F14	4xM10x15dp & 4xM16x24dp
088	417.5	254	234.75	98	221.5	150	36	38	F12	4xM10x15dp & 4xM16x24dp
180	481 (1)	282	266	130	250	190	46	48	F16	4xM20x25dp

## Notes

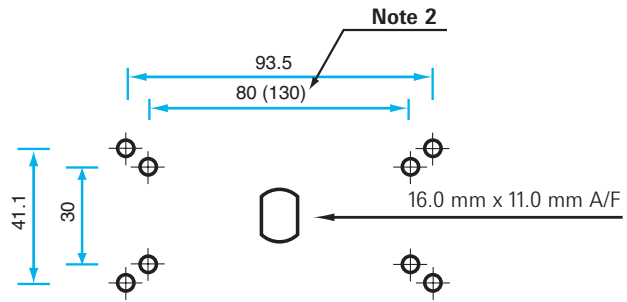
### Note 1

8 x M5 x 8 mm deep.  
Size 002 provides mounting holes at 80 x 30 mm, only.

### Note 2

130 mm for model 180 only.

## Top Mount Drilling (Note 1) mm

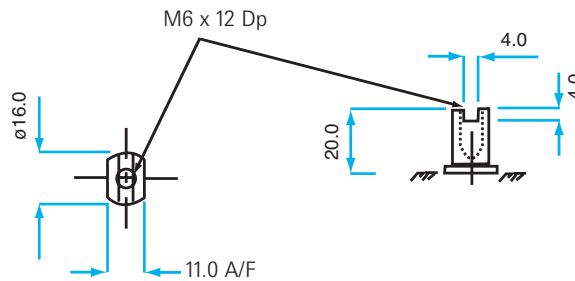


## Notes

### Note 3

Full compliance to this specification is achieved with the addition of a male insert fitted to the top drive (16dia x 11A/F).

## VDI/VE 3845 Mounting (Note 3) mm



## Notes

### Note 4

8 x M5 x 8 mm deep

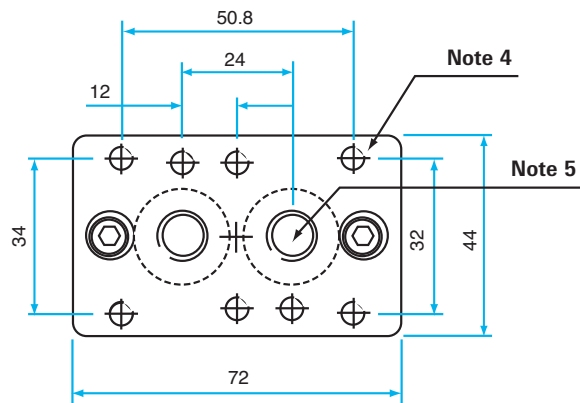
### Note 5

2 x 1/4" ISO228/1-G x 12 mm deep

### Note 6

Model 180 does not have an air connection plate. Drillings are machined into body and aligned vertically (not horizontally, as shown) with port 4 at top.

## Air Connection (Solenoid) Plate mm



## Weight Kg

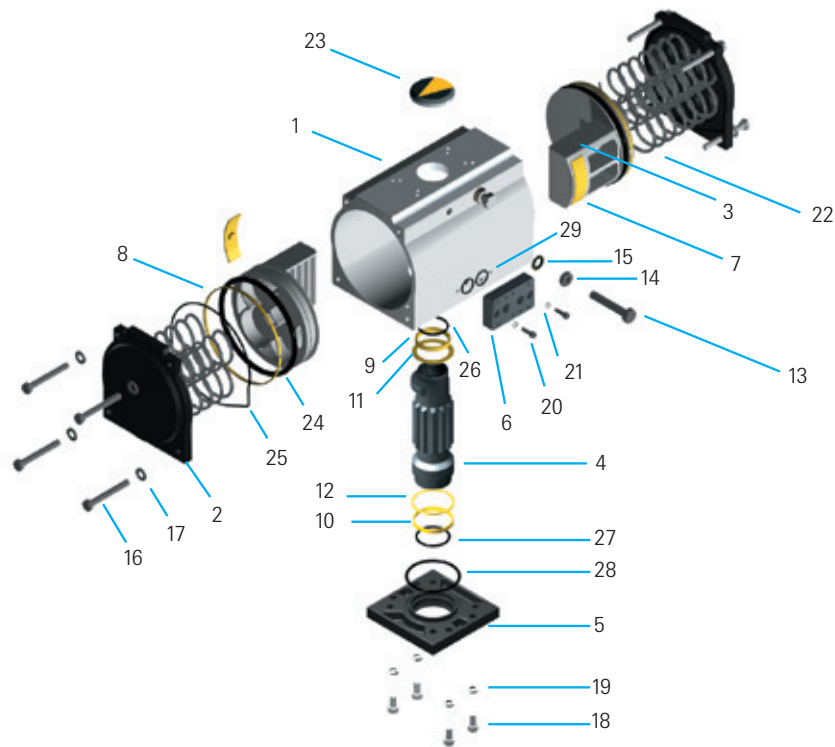
Actuator Size	Double acting	Spring Return
002	1.5	1.6
004	1.9	2.0
009	3.4	3.8
014	4.4	4.9
025	7.3	8.2
037	10.6	11.5
045	15.0	16.0
070	19.0	22.0
088	35.0	40.0
180	45.0	72.0

## Air Consumption Volumes

Actuator Size	On opening		On closing (Double Acting models)	
	cu. in.	litres	cu. in.	litres
002	8.2	0.13	5.2	0.09
004	15.1	0.25	9.4	0.15
009	31.9	0.52	21.2	0.35
014	45.5	0.75	31	0.51
025	78.5	1.29	55	0.9
037	115.6	1.9	79.9	1.31
045	156.1	2.56	105.8	1.74
070	245.2	4.02	165.9	2.72
088	292.5	4.8	196.7	3.23
180	590.7	9.7	408.0	6.7

# PremiAir Pneumatic Actuators

## Parts Identification



### Materials of Construction

Subject	Item	Material	Finish
1	Body	Extruded Aluminium BS 1474 (6000 Series)	Hard Anodise + ESPC*
2	End Cap	Die Cast Aluminium DIN 1725 Alloy 231	Chromate + ESPC*
3	Piston	Die Cast Aluminium DIN 1725 Alloy 231	Anodise
4	Pinion Shaft	Carbon Steel BS 970:1991 212 A42	Nitrotech™**
5	Base Plate	Die Cast Aluminium DIN 1725 Alloy 231	Chromate + ESPC*
6	Air Connection Plate	Aluminium DIN 1725 Alloy 231	Chromate + ESPC*
7	Piston Backing Pad	Devlon-V™	Natural
8	Piston Support Ring	Devlon-V™	Natural
9	Top Bearing	Devlon-V™	Natural
10	Bottom Bearing	Devlon-V™	Natural
11	Top Spacer	Devlon-V™	Natural
12	Bottom Spacer	Devlon-V™	Natural
13	Stop Bolt	Stainless Steel A2 / 70	Natural
14	Lock Nut	Stainless Steel A2 / 70	Natural
15	Sealing Washer	Stainless Steel A2 / 70	Natural
16	End Cap Bolt	Stainless Steel A2 / 70	Natural
17	End Cap Washer	Stainless Steel A2 / 70	Natural
18	Base Plate Bolt	Stainless Steel A2 / 70	Natural
19	Base Plate Washer	Stainless Steel A2 / 70	Natural
20	Air Connection Plate Bolt	Stainless Steel A2 / 70	Natural
21	Air Connection Plate Washer	Stainless Steel A2 / 70	Natural
22	Spring	Chrome Silicon Spring Steel BS 2806 685 A55 HD R2	Oil Dip
23	Indicator	ABS	Natural
24	Piston O-Ring	Rubber-NBR or FPM	Natural
25	End Cap O-Ring	Rubber-NBR or FPM	Natural
26	Shaft Top O-Ring	Rubber-NBR or FPM	Natural
27	Shaft Bottom O-Ring	Rubber-NBR or FPM	Natural
28	Base Plate O-Ring	Rubber-NBR or FPM	Natural
29	Air Connection Plate O-Ring	Rubber-NBR or FPM	Natural

### Notes

- \* ESPC = Electrostatic Powder Coating
- \*\* Nitrotech™ = Proprietary corrosion resistant finish

## Notes

### Double acting models

Using the chart opposite, select the actuator which will provide the nearest torque output above the anticipated torque of the valve (+ safety factor).

### Spring return models

Determine the desired 'failure mode' (fail open or fail closed), then determine the critical torque points for the subject valve using the table below. Using the chart opposite, select the appropriate Spring Rating (far right columns), according to the air supply pressure. Select the actuator which will provide the nearest torque output (both 'start' and 'end of spring') above the anticipated valve torque (+ safety factor).

## Critical torque points

### Butterfly Valves

#### 'Fail Closed'

Start of Air Torque  
End of Spring Torque

### Butterfly Valves

#### 'Fail Open'

Start of Spring Torque  
End of Air Torque

### Ball Valves

#### 'Fail Closed'

Start of Air (unseating) Torque  
End of Air (full open) Torque  
Start of Spring (breakout from open) Torque  
End of Spring (re-seating) Torque

### Ball Valves

#### 'Fail Open'

Start of Spring (unseating) Torque  
End of Spring (full open) Torque  
Start of Air (breakout from open) Torque  
End of Air (re-seating) Torque

## Torque output (Nm) Double Acting Models

Actuator Size	Air Pressure (Bar)					
	3	4	5	5.5	6	7
002	14	19	24	27	29	34
004	26	34	44	48	52	62
009	58	77	98	108	118	139
014	84	113	144	159	173	204
025	150	201	256	281	307	362
037	217	292	371	408	446	525
045	288	386	492	541	590	696
070	452	606	771	848	925	1090
088	535	718	914	1006	1097	1293
180	1094	1467	1867	2054	2241	2641

## Torque output (Nm) Spring Return Models

Actuator Size	Air Pressure (Bar)						Spring Rating		
	3 Start - End Air	4 Start - End Air	5 Start - End Air	5.5 Start - End Air	6 Start - End Air	7 Start - End Air			
002	8-6	13-11	18-16	21-19	23-21	29-26	7-5	3	
		10-7	15-12	18-15	20-17	26-22	11-8	4	
		9-5	14-10	16-13	19-15	24-20	13-9	5	
				12-8	15-11	17-13	23-18	15-11	5.5
				11-6	13-9	16-11	21-16	17-12	6
				10-4	12-7	14-9	20-14	19-14	7
004	16-11 11-3	25-19	34-29	38-33	43-37	52-47	13-8	3	
		20-12	29-21	34-25	38-30	47-39	21-13	4	
		17-8	27-17	31-22	36-26	45-35	24-15	5	
		15-4	24-14	29-18	33-22	42-32	28-17	5.5	
			22-10	26-14	31-19	40-28	32-20	6	
				20-6	24-10	28-15	38-24	36-22	7
009	36-23 25-6	55-43	77-64	86-74	96-83	117-104	30-18	3	
		45-25	66-46	75-56	85-66	106-87	48-29	4	
		39-17	60-38	70-48	80-57	101-78	56-34	5	
		34-8	55-29	64-39	74-49	95-70	65-39	5.5	
			49-20	59-30	69-40	90-61	74-45	6	
				44-12	54-22	63-31	84-53	82-50	7
014	53-36 38-12	82-65	113-96	128-110	142-125	173-156	42-25	3	
		67-41	98-72	112-86	127-101	157-131	66-40	4	
		59-29	90-60	104-74	119-88	150-119	78-48	5	
		51-17	82-48	97-62	111-76	142-107	90-56	5.5	
			74-35	89-50	103-64	134-95	102-63	6	
			67-23	81-38	96-52	126-83	115-71	7	
025	95-56 68-10	146-108	201-162	227-188	252-213	307-268	82-44	3	
		119-61	174-116	199-141	225-167	280-222	129-71	4	
		105-38	160-92	185-118	211-143	266-198	152-85	5	
		91-14	146-69	172-95	197-120	252-175	176-98	5.5	
			133-46	158-71	184-97	238-152	199-112	6	
				119-22	144-48	170-73	225-128	222-126	7
037	140-90 101-27	214-165	294-244	331-281	368-318	448-398	111-62	3	
		176-101	255-180	292-218	329-255	409-334	175-100	4	
		156-69	236-149	273-186	310-223	390-302	207-120	5	
		137-37	216-117	254-154	291-191	370-271	239-139	5.5	
			197-85	234-122	271-159	351-239	270-158	6	
			178-53	215-90	252-127	331-207	302-178	7	
045	179-120 125-36	278-219	383-324	432-373	481-422	587-528	147-88	3	
		223-135	329-240	378-289	427-338	532-444	231-142	4	
		196-93	302-198	351-247	400-296	505-402	273-169	5	
		169-51	274-156	324-205	373-254	478-360	315-196	5.5	
			247-114	296-163	346-212	451-318	357-224	6	
			220-72	269-121	318-171	424-276	399-251	7	
070	279-190 192-59	433-344	598-510	675-587	752-664	918-829	228-140	3	
		347-214	512-379	589-456	666-533	831-698	359-226	4	
		303-148	469-313	546-391	623-468	788-633	424-269	5	
		260-83	425-248	503-325	580-402	745-568	490-312	5.5	
			382-183	459-260	537-337	702-502	555-356	6	
			339-117	416-195	493-272	659-437	620-399	7	
088	332-217 230-58	514-400	710-596	802-687	893-779	1089-985	279-165	3	
		413-241	608-437	700-528	791-620	987-816	438-267	4	
		362-161	558-357	649-449	740-540	936-736	518-317	5	
		311-82	507-278	598-369	689-461	885-656	597-368	5.5	
			456-198	547-290	638-381	834-577	677-419	6	
			405-119	496-210	588-301	783-497	756-470	7	
180	603-346	976-720	1376-1120	1563-1307	1750-1493	2123-1867	667-411	3	
		731-346	1131-746	1317-933	1504-1120	1878-1493	1041-656	4	
		608-159	1008-560	1195-746	1381-933	1782-1333	1228-779	5	
			885-373	1072-559	1259-746	1659-1146	1414-902	5.5	
				763-186	949-373	1136-559	1536-960	1601-1025	6
					826-186	1013-373	1413-773	1788-1147	7

## Control Accessories



## Notes

### Solenoid Valves

A comprehensive range of solenoid valves is available for controlling the pneumatic supply to the actuator cylinder by means of an electrical signal. Alternative specifications of solenoid valves include:

- Weatherproof to IP65
- Explosionproof to ATEX
- Intrinsically safe to ATEX

## AVID Position Monitors



CR



XA

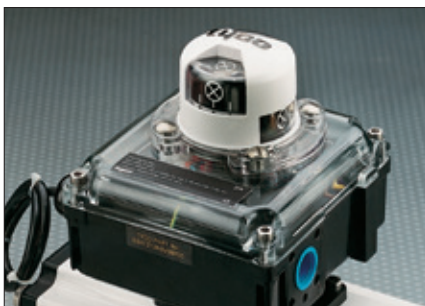
The AVID range of position monitoring equipment incorporates HiVue Local Visual Display, EasiFix Switch adjustment and ModMount Assembly facilities, enabling direct, low profile mounting.

### CR

Corrosion Resistant IP66 Valve Position Monitor

### XA

Flameproof ATEX  $\text{Ex}$  II 2 G D approved position monitor for hazardous area applications



ZR



ZR PLUS

### ZR

Corrosion Resistant ATEX  $\text{Ex}$  II 1 G / 3 D or  $\text{Ex}$  II 2 G / 3 D approved position monitor for general purpose and Intrinsically safe applications

### ZR Plus

Integrated monitoring and control of automated valves in a single, ATEX  $\text{Ex}$  II 1 G / 3 D or  $\text{Ex}$  II 2 G / 3 D approved package

## AVID Positioners



EaziCal IR®



SmartCal®

The AVID range of analogue and smart positioners offers solutions to the precise positioning of pneumatic actuators are mounted to the actuator housing using NAMUR (VDI/VDE 3845) standards.

### EaziCal IR®

Analogue positioner with AutoCal calibration certified general purpose IP66

### SmartCal®

ATEX  $\text{Ex}$  II 2 G approved intelligent positioner allowing for AutoCal keypad calibration, Hart® communications capability and on-site diagnostic information.

## Network Solutions



The AVID range of PlantNet monitors facilitates communication with AS Interface, DeviceNet, Fieldbus Foundation and Profibus Network protocols to enable complete system integration of all valve units.