

CATALOG

cylinders

Series 452

Standard Cylinder to ISO 15552



numatics®

Numatics, Inc. is a leading manufacturer of pneumatic products and motion control products. Our broad spectrum of standard, custom developed products and application components, have made a significant impact on pneumatic innovation as well as pneumatic and motion control technology. Our company has an extensive history of generating innovative concepts and technological breakthroughs. Many of today's standard features in pneumatic technology were industry firsts from Numatics. We continue our innovative approach to product development by developing electric motion control solutions and enhancing our embedded Fieldbus and I/O products to continually meet and solve our customer's application requirements.



Today Numatics is proud to be a part of the Industrial Automation Division of Emerson Electric Co.

Emerson (NYSE: EMR) is a global company that brings together technology and engineering to provide innovative solutions for customers in a wide range of industrial, commercial, and consumer markets.

Numatics, along with the vast resources of the Emerson organization, will assure that our proud history of innovation and service will continue to meet the needs of our global customers.

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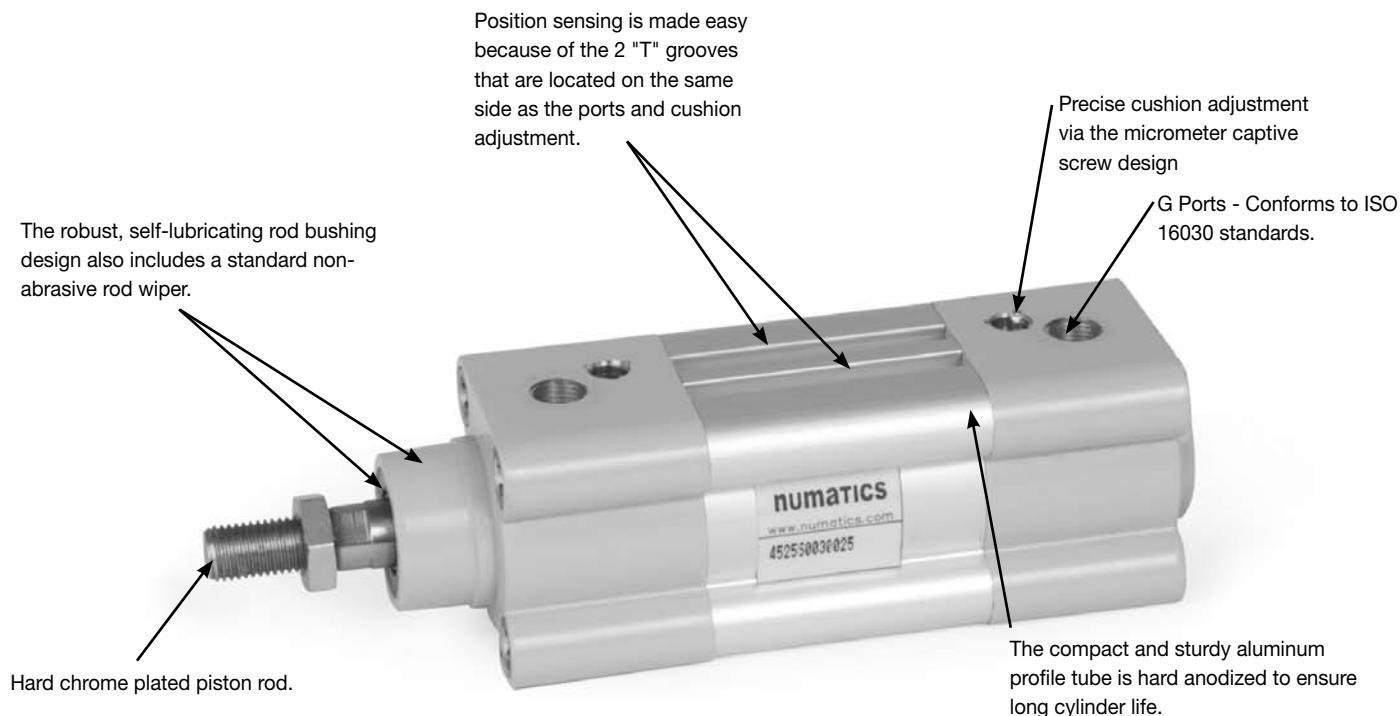


Series 452 ISO 15552

numatics®

Series 452 (Profile Tube)

The Series 452 is an aluminum body air cylinder line that is designed to meet all international cylinder requirements. The Series 452 meets the following international standards: ISO/DIS 15552 & AFNOR. The combination of robust construction and a multitude of value-added features make the Series 452 the superior ISO 15552 cylinder line in the market.



General

Detection:	Equipped for magnetic position sensors
Fluid:	Air
Operating pressure:	10 bar max./150 PSI
Ambient temperature:	-20°C to +70°C (-4° F to 158° F)
Optimal max. speed:	≤ 1 m/s (for optimal service life)
Max. speed rate:	2 m/s
Standards:	ISO 15552-AFNOR NF ISO 15552-DIN ISO 15552 (replace ISO 6431-AFNOR NFE 49003-VDMA 24562)

Construction

Tube:	Hard anodized aluminium alloy
End Caps:	Aluminium alloy
Tube/End Cap Connection:	Steel sleeve bolts
Bearing:	Self lubricating steel backed composite
Cushioning seals:	PUR (polyurethane)
Cushioning:	Pneumatic, adjustable from both sides with captive screw
Rod:	Hard chrome plated steel
Rod nut:	Galvanized steel
Piston:	Ø 32 to 80 mm: POM (polyacetal) Ø 100 mm: light alloy, fitted with an annular permanent magnet
Piston seals:	PUR (polyurethane)



How To Order

452 1 00 0 5 0080 000

Series _____
452 Series = Profile Tube

Version _____
1 = ISO 15552

Cylinder Type _____
00 = Single Rod, Cushioned
0A = Double Rod, Cushioned

Sensor Groove Location _____
0 = Position 1
3 = Position 2
6 = Position 3
9 = Position 4

Bore _____
3 = 32mm
4 = 40mm
5 = 50mm
6 = 63mm
8 = 80mm
1 = 100mm

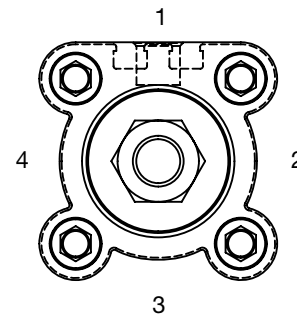
Options
000 = Cylinder w/o mounting parts and options
0E1 = No Cushions
01A = Rod Extension
02A = Thread Extension
0SA = Stainless Rod
01R = Special Rod Thread
012 = Rod and Thread Extension
BMI = Nu Lock Rod Lock Mount
C01 = Foot Bracket (Outside) Mount
CV9 = Mid Trunnion
CF2 = Front Flange Mount
CR2 = Rear Flange Mount
CF4 = Rod Clevis Mount
CD4 = Rod Clevis Mount Both Ends (Double Rod)
CF5 = Spherical Eye Mount (Front Side)
CD5 = Spherical Eye Mount (Both Sides - Double Rod)
C07 = Oscillating Bracket with Lugs
C08 = Oscillating Bracket with Wide Fork Type Mount
C13 = Spherical Eye Mount (Back Side)
C14 = Oscillating Bracket with Narrow Fork Type Mount
Consult factory for combination options.

Stroke
0005 = 5mm (Minimum Stroke)
2000 = 2000mm (Maximum Stroke)

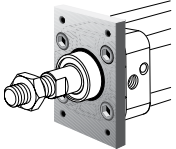
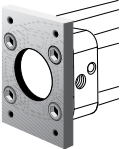
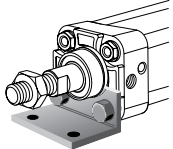
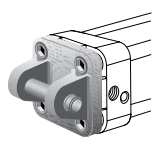
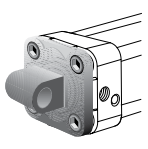
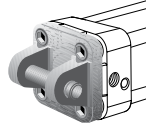
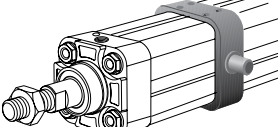
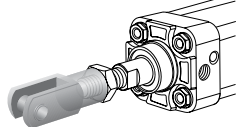
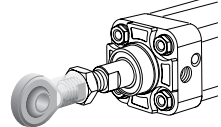
Port Chart

Bore	Port Size	Rod Threads
32mm	G 1/8	M10 x 1.25
40mm	G 1/4	M12 x 1.25
50mm	G 1/4	M16 x 1.25
63mm	G 3/8	M16 x 1.50
80mm	G 3/8	M20 x 1.50
100mm	G 1/2	M20 x 1.50

Switch/Sensor Position



Standard Cylinder Mounting Options

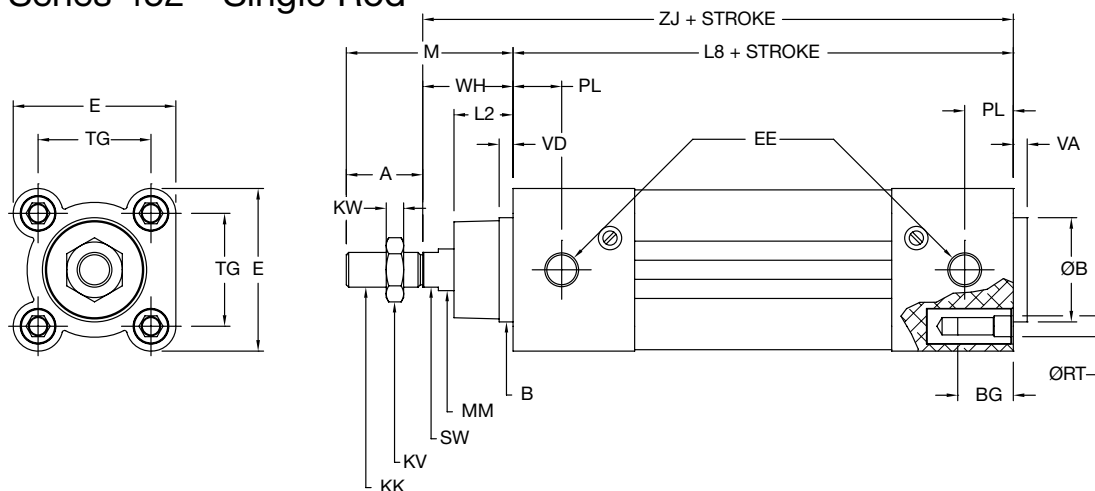
				
CF2 - Front Flange	CR2 - Rear Flange	C01 - Foot	C08 - Oscillating Bracket with Wide Fork Type Mount	C07 - Oscillating Bracket with Lugs
				
C14 - Oscillating Bracket with Narrow Fork Type Mount	CV9 - Mid Trunnion		CF4 - Front Clevis	CF5 - Spherical Eye Mount (Front Side)



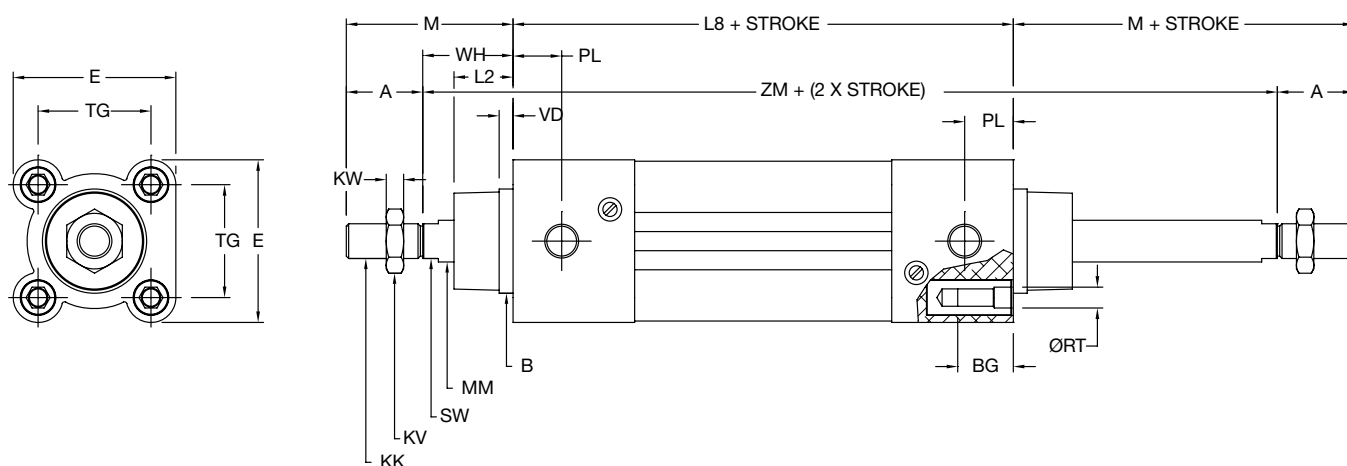
Series 452 ISO 15552

numatics®

Series 452 - Single Rod



Series 452 - Double Rod



Dimensions (mm) , Weight (kg)

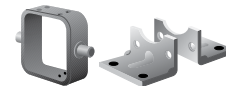
Ø	A	*ØB ^{d11}	BG	E	EE	KK	KV	KW	L2	L8	M	ØMM	PL	ØRT	SW	TG	VA	VD (min.)
32	22	30	16	46.5	G1/8	M10x1.25	16	5	17	94	48	12	14	M6	10	32.5 ±0.5	4	4
40	24	35	16	52	G1/4	M12x1.25	18	6	19	105	54	16	16	M6	13	38 ±0.5	4	4
50	32	40	16	64	G1/4	M16x1.5	24	8	24	106	69	20	18.5	M8	17	46.5 ±0.5	4	4
63	32	45	16	74	G3/8	M16x1.5	24	8	24	121	69	20	19	M8	17	56.5 ±0.5	4	4
80	40	45	17	92	G3/8	M20x1.5	30	10	33	128	86	25	16.5	M10	22	72 ±0.5	4	4
100	40	55	17	109	G1/2	M20x1.5	30	10	35.5	138	91	25	19.5	M10	22	89 ±0.5	4	4

Ø	WH	ZJ	ZM	Weight	
				①	②
32	26	120	146	0.417	0.256
40	30	135	165	0.687	0.341
50	37	143	180	0.875	0.492
63	37	158	195	1.152	0.542
80	46	174	220	2.052	0.818
100	51	189	240	3.045	0.913

① Cylinder weight with 0 mm stroke

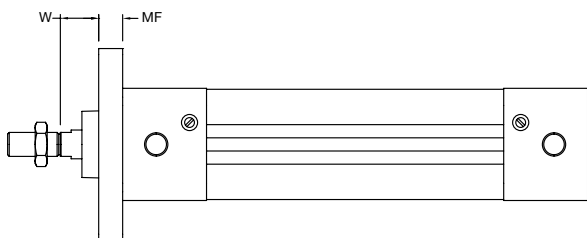
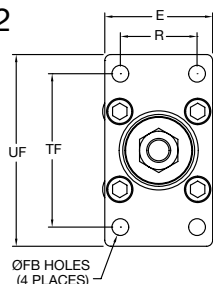
② Weight to be added per additional 100 mm length.

*Dimensional tolerances according to standard ISO 15552

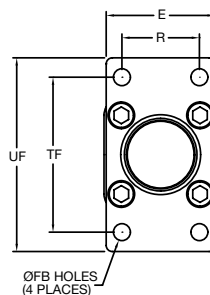
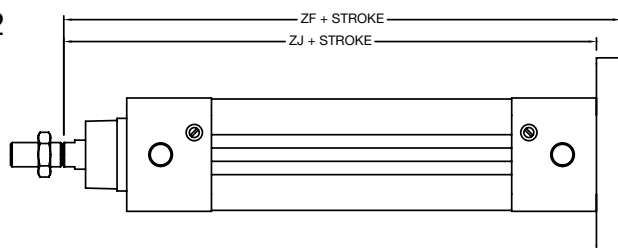


Rectangular Front or Rear Mounting Flange - (CF2 and CR2)

CF2



CR2

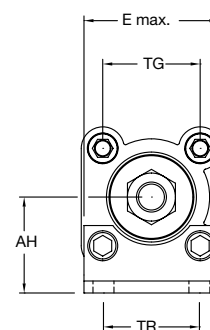
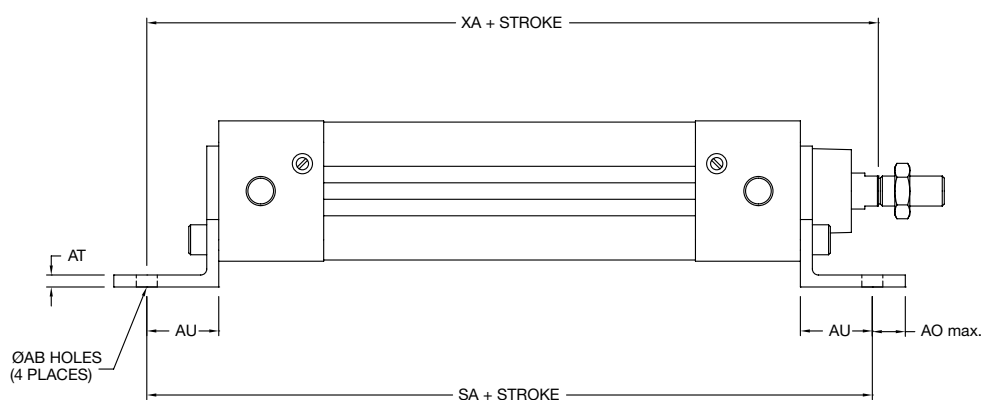


Dimensions (mm) , Weight (kg)

Ø	E	ØFB	MF	R	TF	UF	W	ZJ	ZF	WEIGHT
32	50	7	10	32	64	86	16	120	130	0.190
40	58	9	10	36	72	96	20	135	145	0.245
50	70	9	12	45	90	115	25	143	155	0.500
63	85	9	12	50	100	130	25	158	170	0.580
80	105	12	16	63	126	165	30	174	190	1.390
100	130	14	16	75	150	187	35	189	205	1.630

Weight based off of steel mounting hardware.

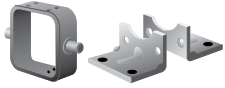
Foot Bracket Mount - C01



Dimensions (mm) , Weight (kg)

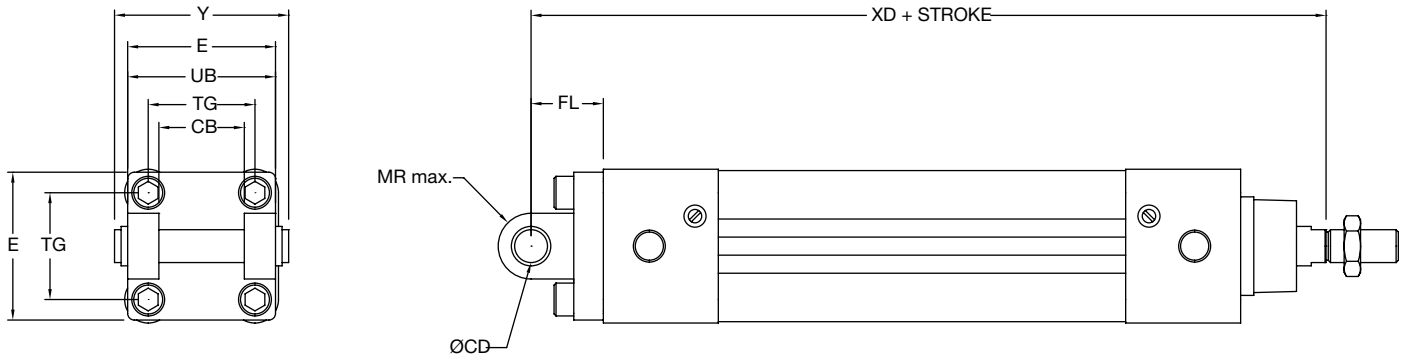
Ø	ØAB	AO	AH	AT	AU	E	TR	TG	SA	XA	WEIGHT 2 (BRACKET SET)
32	7	11	32	4	24	50	32	32.5	142	144	0.150
40	10	15	36	4	28	58	36	38	161	163	0.190
50	10	15	45	5	32	70	45	46.5	170	175	0.395
63	10	15	50	5	32	85	50	56.5	185	190	0.445
80	12	20	63	6	41	105	63	72	210	215	0.790
100	14.5	25	71	6	41	130	75	89	220	230	1.400

Weight based off of steel mounting hardware.

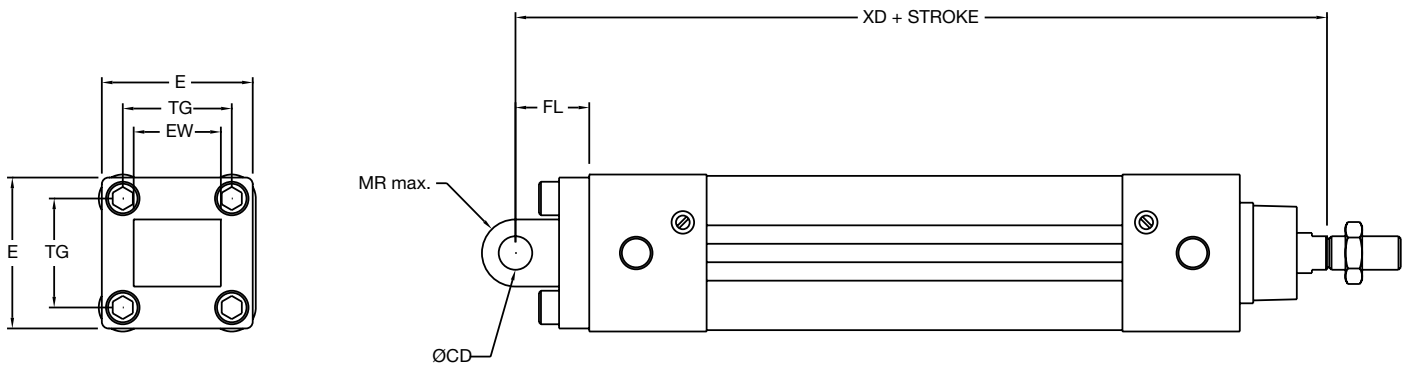


Standard Mount Information

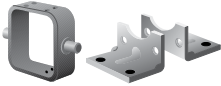
Oscillating Bracket with Fork Type Mount - C08



Oscillating Bracket with Lugs - C07



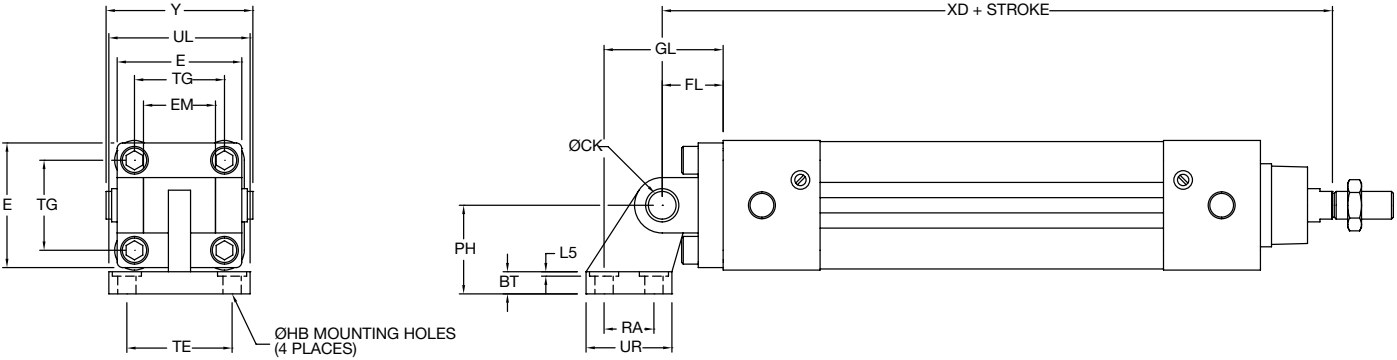
BORE	E	Y	CB	CD	EW	FL	MR	TG	UB	XD	WEIGHT (kg)	
											C07	C08
32mm	46.5	56	26	10	26	22	11	32.5	45	142	0.085	0.105
40mm	52	63	28	12	28	25	13	38	52	160	0.092	0.150
50mm	64	71	32	12	32	27	13	46.5	60	170	0.170	0.240
63mm	74	81	40	16	40	32	17	56.5	70	190	0.250	0.370
80mm	92	101	50	16	50	36	17	72	90	210	0.445	0.635
100mm	109	128	60	20	60	41	21	89	110	230	0.755	0.990



Right Angle Articulated Joint - C11

These mountings must be ordered separately

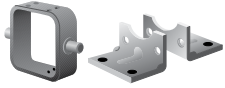
BORE Ø	32	40	50	63	80	100
WEIGHT (kg)						
Aluminum	0.160	0.230	0.390	0.570	0.950	1.500



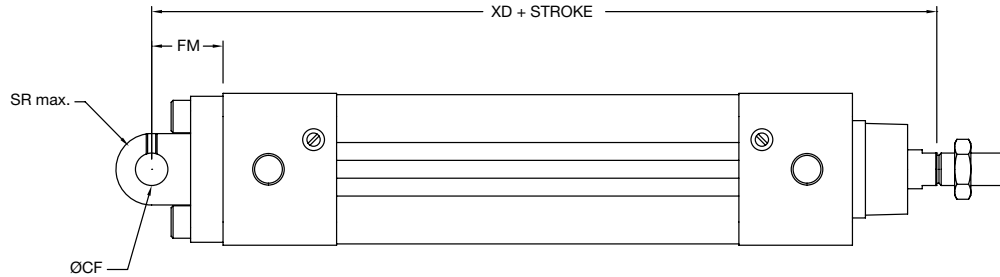
Dimensions (mm)

Ø	BT	ØCK	E	EM	*GL ^{JS14}	ØHB	L5	*PH ^{JS14}	RA	TE	TG	UL	UR	Y	XD
32	8	10	50	26	21	6.6	1.6	32	18	38	32.5	51	31	56	142
40	10	12	58	28	24	6.6	1.6	36	22	41	38	54	35	63	160
50	12	12	70	32	33	9	1.6	45	30	50	46.5	65	45	71	170
63	12	16	85	40	37	9	1.6	50	35	52	56.5	67	5	81	190
80	14	16	105	50	47	11	2.5	63	40	66	72	86	60	101	210
100	15	20	130	60	55	11	2.5	71	50	76	89	96	70	125	230

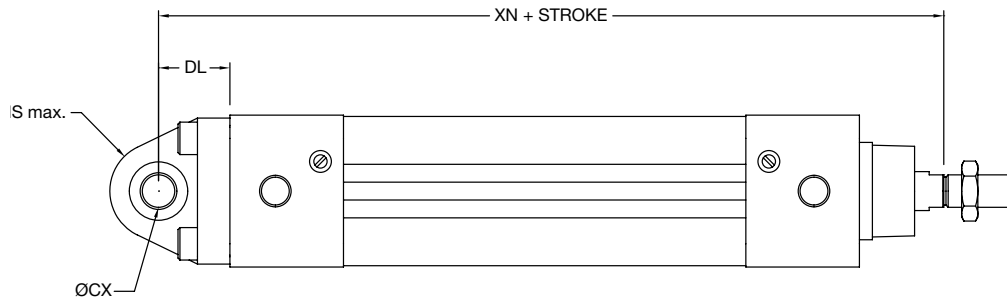
*Dimensional tolerances according to ISO standards.



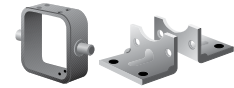
Oscillating Bracket with Narrow Fork Type Mount - C14



Spherical Eye Mount (Back Side) - C13



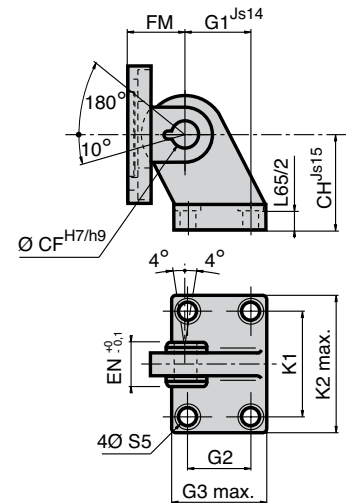
BORE	CX	DL	FM	SR	XD	XN	WEIGHT (kg)	
							C13	C14
32mm	10	22	22	11	142	142	0.180	0.190
40mm	12	25	25	13	160	160	0.290	0.300
50mm	16	27	27	18	170	170	0.420	0.460
63mm	16	32	32	18	190	190	0.650	0.680
80mm	20	36	36	22	210	210	1.210	1.460
100mm	20	41	41	22	230	230	1.870	2.130



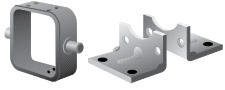
Right Angle Articulated Joint with Spherical Bushing - C12

These mountings must be ordered separately

BORE Ø	32	40	50	63	80	100
WEIGHT						
Steel	0.370	0.530	0.910	1.200	2.400	3.200



Ø	CH	ØCF	FM	EN	G1	G2	G3	K1	K2	L65/2	ØS5
32	32	10	22	14	21	18	31	38	51	8.5	6.6
40	36	12	25	16	24	22	35	41	54	8.5	6.6
50	45	16	27	21	33	30	45	50	65	10	9
63	50	16	32	21	37	35	50	52	67	10	9
80	63	20	36	25	47	40	60	66	86	11.5	11
100	71	20	41	25	55	50	70	76	96	12.5	11

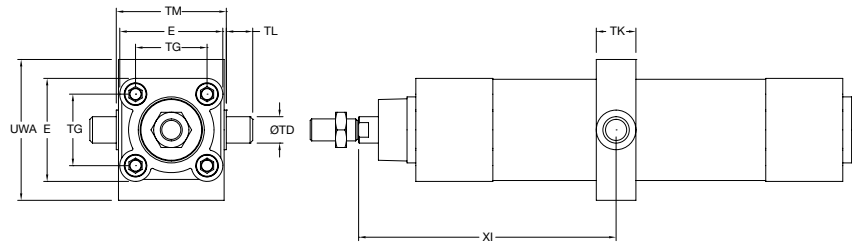


Mid Trunnion Mount - CV9

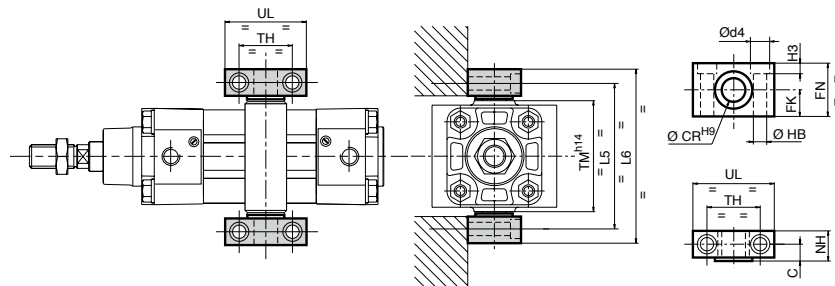
WITH "T" DETECTORS			
Ø MM	XV MAX.	XV MIN.	① MIN.
32	46 + ①	100	54
40	56 + ①	109	53
50	65 + ①	115	50
63	77 + ①	117	41
80	89 + ①	130	42
100	101 + ①	139	38

Dimension XI is specified on order

① Stroke



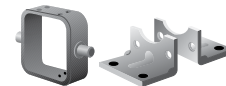
Mounting Blocks for Mid Trunnion



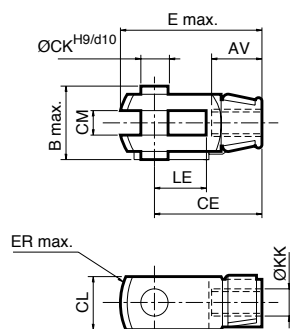
Dimensions (mm) , Weight (kg)

Ø	C	CR	ØD4	FK	FN	HB	H3	L5	L6	NH	TG	TH	TK	TD ^{TPC9}	TL ^{H14}	TM	UL	ZJ
32	10.5	12	11	15	30	6.6	6.8	71	86	18	32.5	32	18	12	12	50	46	120
40	12	16	15	18	36	9	9	87	105	20	38	36	20	16	16	63	55	135
50	12	16	15	18	36	9	9	99	117	20	46.5	36	20	16	16	75	55	143
63	13	20	18	20	40	11	11	116	136	23	56.5	42	25	20	20	90	65	158
80	13	20	18	20	40	11	11	136	156	23	72	42	25	20	20	110	65	174
100	16	25	20	25	50	13.5	13	164	189	28,5	89	50	30	25	25	132	75	189

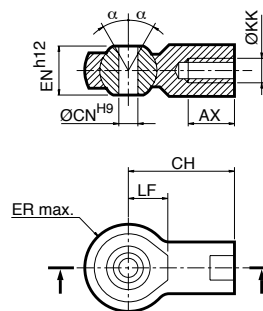
WEIGHT		
Ø	MID TRUNNION	SUPPORTS
	MT4 for PES 450	Set (2 Supports)
32	0.200	0.120
40	0.400	0.230
50	0.500	0.230
63	0.900	0.330
80	1.100	0.330
100	1.860	0.580



Female Clevis - CF4



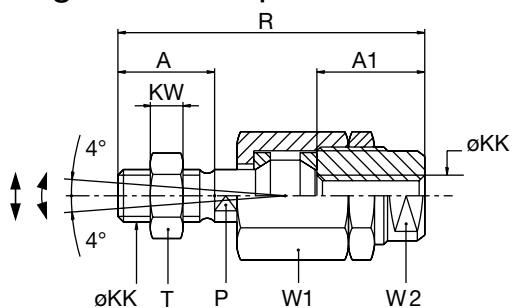
Spherical Bearing Rod End - CF5



α: spherical angular compensation 4°

Ø CYLINDERS	AV-AX	B	CE	CH	ØCK	CL	CM	ØCN	E	EN	ER	ØKK	LE	LF	WEIGHT (kg)	
															CF4	CF5
32	20	26	40	43	10	20	10 ^{+0.5/+0.15}	10	56	14	14	M10x1.25	20	15	0.100	0.070
40	22	32	48	50	12	24	12 ^{+0.5/+0.15}	12	67	16	16	M12x1.25	24	17	0.150	0.120
50	28	41	64	64	16	32	16 ^{+0.5/+0.15}	16	89	21	21	M16x1.5	32	22	0.330	0.220
63	28	41	64	64	16	32	16 ^{+0.5/+0.15}	16	89	21	21	M16x1.5	32	22	0.330	0.220
80	33	48	80	77	20	40	20 ^{+0.6/+0.15}	20	112	25	25	M20x1.5	40	26	0.670	0.390
100	33	48	80	77	20	40	20 ^{+0.6/+0.15}	20	112	25	25	M20x1.5	40	26	0.670	0.390

Alignment Coupler



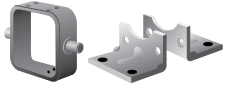
- ① Stroke
- ② Dimensions on Flats

Ø CYLINDERS	A	A1	P(2)	ØKK	KW	R	T	W1	W2	X	RADIAL COMPENSATION (mm)	WEIGHT (kg)
32	22	26	12	M10x1.25	6	73	17	30	19	58	0.7	0.210
40	24	26	12	M12x1.25	7	77	19	30	19	59	0.7	0.210
50	32	34	19	M16x1.5	8	106	24	42	30	82	1	0.650
63	32	34	19	M16x1.5	8	106	24	42	30	82	1	0.650
80	40	42	19	M20x1.5	9	122	30	42	30	92	1	0.680
100	40	42	19	M20x1.5	9	122	30	42	30	92	1	0.680

Radial compensation: 0,5 to 1 mm (see table)

Spherical angular: compensation : 4°

Note: The compensator is preset with an axial clearance of 0,05 to 0,1 - Do not reset.



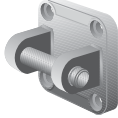
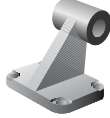
Standard Mount Information

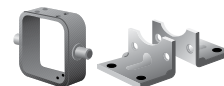
Standard Mounting Hardware

Mountings Conforming with ISO 2128 7- ISO 15552 - AFNOR NF ISO 15552 - DIN ISO 15552 Standards

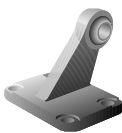
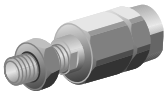
			
	low feet ^① C01	rectangular front or rear flange CF2 - CR2	Mid Trunnion - CV9
			supplied fixed/XI
CONSTRUCTION	stamped sheet steel	steel	cast iron
FOR CYLINDER Ø	CATALOG NUMBER		
32	43400163	43400119	410564
40	43400164	43400120	410604
50	43400165	43400121	410566
63	43400166	43400122	410605
80	43400167	43400123	410606
100	43400168	43400124	410607

① Corresponds to a set of 2 parts.

			
	Oscillating Bracket with Wide Fork Type Mount - C08	Oscillating Bracket with Lugs - C07	angular clevis bracket C11
CONSTRUCTION	aluminium + bushing	light alloy	aluminium + bushing
FOR CYLINDER Ø	CATALOG NUMBER		
32	43400130	43400125	43400383
40	43400131	43400126	43400384
50	43400132	43400127	43400385
63	43400133	43400128	43400386
80	43400134	43400129	43400387
100	43400135	43400161	43400388



Standard Mounting Hardware (continued)

	 narrow cap clevis for spherical eye or clevis bracket C14	 cap eye with spherical eye ⑥ C13	 angular clevis bracket spherical bearing ⑥ C12	 Female rod clevis ⑧ ISO 8140 - RP102P CF4	 spherical rod end ISO8139-RP103P CF5	 alignment compensator ⑦ C16
CONSTRUCTION	forged steel	forged steel	forged steel	steel	steel	steel
FOR CYLINDER Ø	CATALOG NUMBER					
32	43400363	43400372	43400354	43400016	43400001	43400242
40	43400364	43400373	43400355	43400017	43400002	43400243
50	43400365	43400374	43400356	43400018	43400003	43400244
63	43400366	43400375	43400357	43400018	43400003	43400244
80	43400367	43400376	43400358	43400019	43400004	43400245
100	43400368	43400377	43400359	43400019	43400004	43400245

⑥ These accessories allows accurate angular compensation adjustment spherical of 4°

⑦ This accessory allows accurate angular compensation adjustment spherical of 4° and radial of 0.7 mm



"T Slot" Position Detectors Reed Switch and Magneto-Resistive Types

Sensors

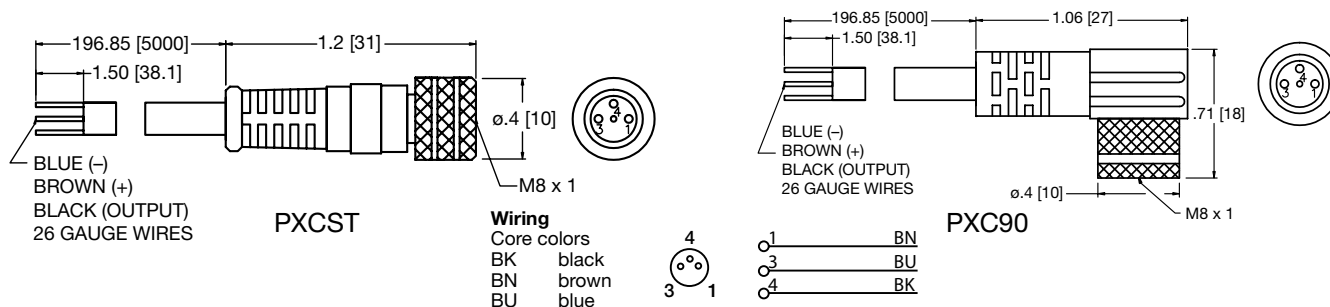
Direct Mount
No Bracket Required



SENSOR DESCRIPTION	STANDARD CORD SET	QUICK DISCONNECT
Reed Switch	REED-FL2-00	REED-QDS-M8U
Hall PNP	PNP-FL2-00-U	PNP-QDS-M8-U
Hall NPN	NPN-FL2-00-U	NPN-QDS-M8-U

See page 15, 16, & 17 for Sensor Specifications

Quick Disconnect Cables



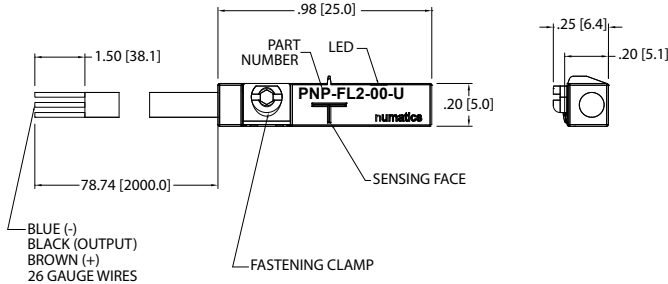
ORDER CODE	TYPE	OPERATING VOLTAGE	CURRENT RATING	CABLE MATERIAL	PROTECTION	CONNECTOR
PXCST	Straight 5 m Cable (3 x 26 Gauge wire)	60 AC/75 DC	3 A	PUR	IP 68, III	M8
PXC90	90° 5 m Cable (3 x 26 Gauge wire)	60 AC/75 DC	3 A	PUR	IP 68, III	M8



"T Slot" Position Detectors Reed Switch and Magneto-Resistive Types

Sensing Part Numbers

PNP-FL2-00-U



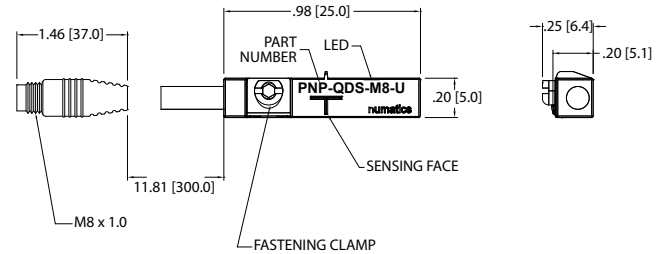
ELECTRICAL DESIGN	DC PNP
OUTPUT	Normally Open
OPERATING VOLTAGE	10-30 VDC
CURRENT RATING	100 mA
SHORT-CIRCUIT PROTECTION	Yes
OVERLOAD PROTECTION	Yes
REVERSE POLARITY PROTECTION	Yes
VOLTAGE DROP	< 2.5 V
CURRENT CONSUMPTION	< 12 mA
REPEATABILITY	< .2mm
POWER-ON DELAY TIME	< 30 ms
SWITCH FREQUENCY	> 3000 Hz
AMBIENT TEMPERATURE	-25°C to 85°C
PROTECTION	IP 67, III
HYSTERESIS	1.0mm
MAGNETIC SENSITIVITY	2.0 mT
TRAVEL SPEED	> 10 m/s
HOUSING MATERIAL	PA (Polyamide) Black; Fastening Clamp: Stainless Steel
FUNCTION DISPLAY SWITCHING STATUS	Yellow LED
CONNECTION	Flying Leads, Pur Cable (2m Long, 3 x26 Gauge Wire)

REMARKS	Clamping Screw with Combined Slot/Hexagon Socket Head AF 1.5 cULus - Class 2 Source Required
---------	---

ACCESSORIES	Rubber Placeholder, Cable Clip, and Cut Sheet To Be Provided with Every Switch
-------------	--

AGENCY APPROVALS	  
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PNP-QDS-M8-U



ELECTRICAL DESIGN	DC PNP
OUTPUT	Normally Open
OPERATING VOLTAGE	10-30 VDC
CURRENT RATING	100 mA
SHORT-CIRCUIT PROTECTION	Yes
OVERLOAD PROTECTION	Yes
REVERSE POLARITY PROTECTION	Yes
VOLTAGE DROP	< 2.5 V
CURRENT CONSUMPTION	< 12 mA
REPEATABILITY	< .2mm
POWER-ON DELAY TIME	< 30 ms
SWITCH FREQUENCY	> 3000 Hz
AMBIENT TEMPERATURE	-25°C to 85°C
PROTECTION	IP 67, III
HYSTERESIS	1.0mm
MAGNETIC SENSITIVITY	2.0 mT
TRAVEL SPEED	> 10 m/s
HOUSING MATERIAL	PA (Polyamide) Black; Fastening Clamp: Stainless Steel
FUNCTION DISPLAY SWITCHING STATUS	Yellow LED
CONNECTION	M8 Connector (Snap Fit) , Pur Cable (.3 m)

REMARKS	Clamping Screw with Combined Slot/Hexagon Socket Head AF 1.5 cULus - Class 2 Source Required
---------	---

ACCESSORIES	Rubber Placeholder, Cable Clip, and Cut Sheet To Be Provided with Every Switch
-------------	--

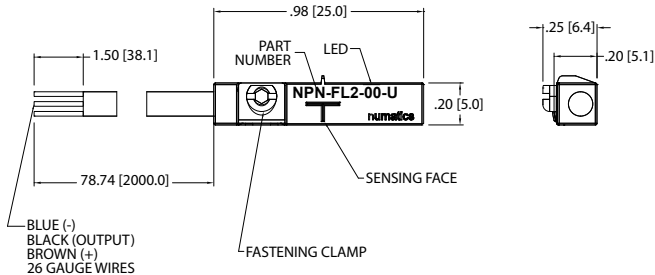
AGENCY APPROVALS	  
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"T Slot" Position Detectors Reed Switch and Magneto-Resistive Types

Sensing Part Numbers

NPN-FL2-00-U



ELECTRICAL DESIGN	DC NPN
OUTPUT	Normally Open
OPERATING VOLTAGE	10-30 VDC
CURRENT RATING	100 mA
SHORT-CIRCUIT PROTECTION	Yes
OVERLOAD PROTECTION	Yes
REVERSE POLARITY PROTECTION	Yes
VOLTAGE DROP	< 2.5 V
CURRENT CONSUMPTION	< 12 mA
REPEATABILITY	< .2mm
POWER-ON DELAY TIME	< 30 ms
SWITCH FREQUENCY	> 3000 Hz
AMBIENT TEMPERATURE	-25°C to 85°C
PROTECTION	IP 67, III
HYSTERESIS	1.0mm
MAGNETIC SENSITIVITY	2.0 mT
TRAVEL SPEED	> 10 m/s
HOUSING MATERIAL	PA (Polyamide) Black; Fastening Clamp: Stainless Steel

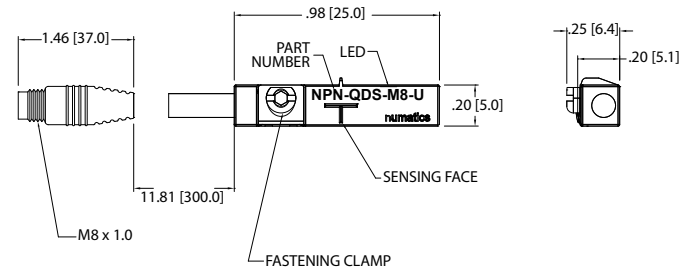
FUNCTION DISPLAY SWITCHING STATUS	Yellow LED
CONNECTION	Flying Leads, Pur Cable (2m Long, 3 x26 Gauge Wire)

REMARKS	Clamping Screw with Combined Slot/Hexagon Socket Head AF 1.5 cULus - Class 2 Source Required
---------	---

ACCESSORIES	Rubber Placeholder, Cable Clip, and Cut Sheet To Be Provided with Every Switch
-------------	--

AGENCY APPROVALS	
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NPN-QDS-M8-U



ELECTRICAL DESIGN	DC NPN
OUTPUT	Normally Open
OPERATING VOLTAGE	10-30 VDC
CURRENT RATING	100 mA
SHORT-CIRCUIT PROTECTION	Yes
OVERLOAD PROTECTION	Yes
REVERSE POLARITY PROTECTION	Yes
VOLTAGE DROP	< 2.5 V
CURRENT CONSUMPTION	< 12 mA
REPEATABILITY	< .2mm
POWER-ON DELAY TIME	< 30 ms
SWITCH FREQUENCY	> 3000 Hz
AMBIENT TEMPERATURE	-25°C to 85°C
PROTECTION	IP 67, III
HYSTERESIS	1.0mm
MAGNETIC SENSITIVITY	2.0 mT
TRAVEL SPEED	> 10 m/s
HOUSING MATERIAL	PA (Polyamide) Black; Fastening Clamp: Stainless Steel

FUNCTION DISPLAY SWITCHING STATUS	Yellow LED
CONNECTION	M8 Connector (Snap Fit) , Pur Cable (.3 m)

REMARKS	Clamping Screw with Combined Slot/Hexagon Socket Head AF 1.5 cULus - Class 2 Source Required
---------	---

ACCESSORIES	Rubber Placeholder, Cable Clip, and Cut Sheet To Be Provided with Every Switch
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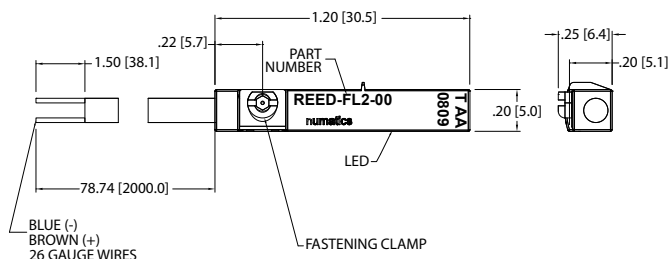
AGENCY APPROVALS	
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"T Slot" Position Detectors Reed Switch and Magneto-Resistive Types

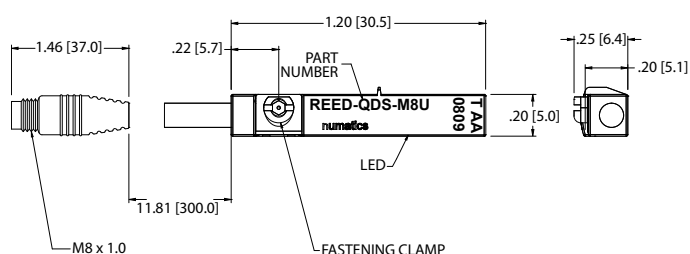
Sensing Part Numbers

REED-FL2-00 REED-FL2-00S



ELECTRICAL DESIGN	AC/DC REED
OUTPUT	Normally Open
OPERATING VOLTAGE	5-120 VAC/DC
CURRENT RATING	100 mA*
SHORT-CIRCUIT PROTECTION	No
OVERLOAD PROTECTION	No
REVERSE POLARITY PROTECTION	Yes
VOLTAGE DROP	< 5 V
REPEATABILITY	± .2mm
MAKETIME INCLUDING BOUNCE	< .6 ms
BREAKTIME	< .1 ms
SWITCHING POWER (MAX)	5 W
SWITCH FREQUENCY	1000 Hz
AMBIENT TEMPERATURE	-25°C to 70°C
PROTECTION	IP 67, II
HYSTERESIS	.9mm
HOUSING MATERIAL	PA (Polyamide) Black; Fastening Clamp: Stainless Steel
FUNCTION DISPLAY SWITCHING STATUS	Yellow LED
CONNECTION	Flying Leads, Pur Cable (2m Long, 2 x26 Gauge Wire)
REMARKS	*External Protective Circuit for Inductive Load (Valve, Contactor, Etc.) Necessary. Conforms to 2008 NEC Section 725 III, Class 2 Circuits Clamping Screw with Combined Slot/Hexagon Socket Head AF 1.5. No LED Function in case of Polarity in DC Operation
ACCESSORIES	Rubber Placeholder, Cable Clip, and Cut Sheet To Be Provided with Every Switch
AGENCY APPROVALS	 RoHS

REED-QDS-M8U REED-QDS-M8S

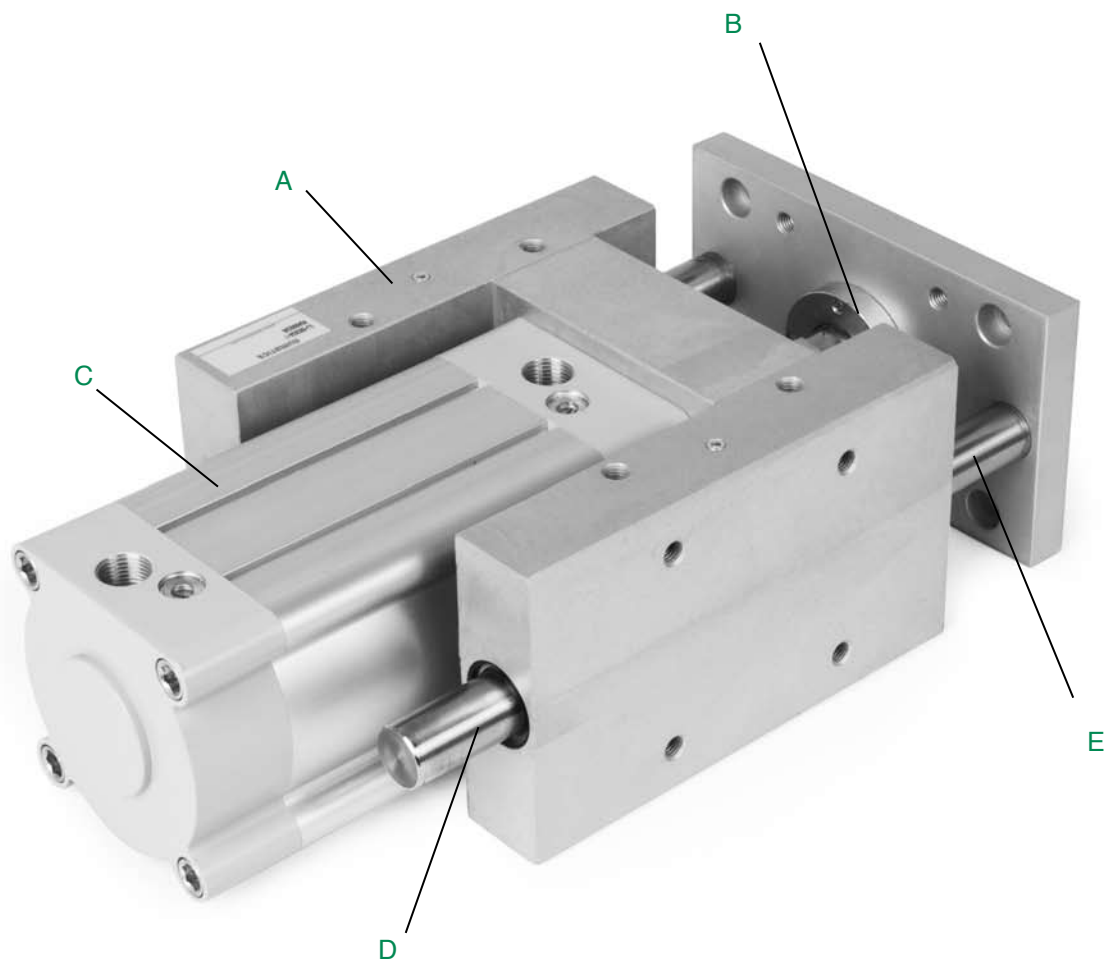


ELECTRICAL DESIGN	AC/DC REED
OUTPUT	Normally Open
OPERATING VOLTAGE	*5-60 VDC / 5-50 VAC
CURRENT RATING	100 mA
SHORT-CIRCUIT PROTECTION	No
OVERLOAD PROTECTION	No
REVERSE POLARITY PROTECTION	Yes
VOLTAGE DROP	< 5 V
REPEATABILITY	± .2mm
MAKETIME INCLUDING BOUNCE	< .6 ms
BREAKTIME	< .1 ms
SWITCHING POWER (MAX)	5 W
SWITCH FREQUENCY	1000 Hz
AMBIENT TEMPERATURE	-25°C to 70°C
PROTECTION	IP 67, II
HYSTERESIS	.9mm
HOUSING MATERIAL	PA (Polyamide) Black; Fastening Clamp: Stainless Steel
FUNCTION DISPLAY SWITCHING STATUS	Yellow LED
CONNECTION	M8 Connector (Snap Fit), Pur Cable (.3m)
REMARKS	*External Protective Circuit for Inductive Load (Valve, Contactor, Etc.) Necessary. Conforms to 2008 NEC Section 725 III, Class 2 Circuits M8 Connector voltage limited to 5-60 vdc / 5-50 vac to conform with 2008 IEC 61076-2-104 Clamping Screw with Combined Slot/Hexagon Socket Head AF 1.5. No LED Function in case of Polarity in DC Operation
ACCESSORIES	Rubber Placeholder, Cable Clip, and Cut Sheet To Be Provided with Every Switch
AGENCY APPROVALS	 RoHS



452 Series Slide

The ISO VDMA Guide units conform to the ISO standards. Utilizing the GeoMetric cylinders these guide units offer high load carrying capabilities.

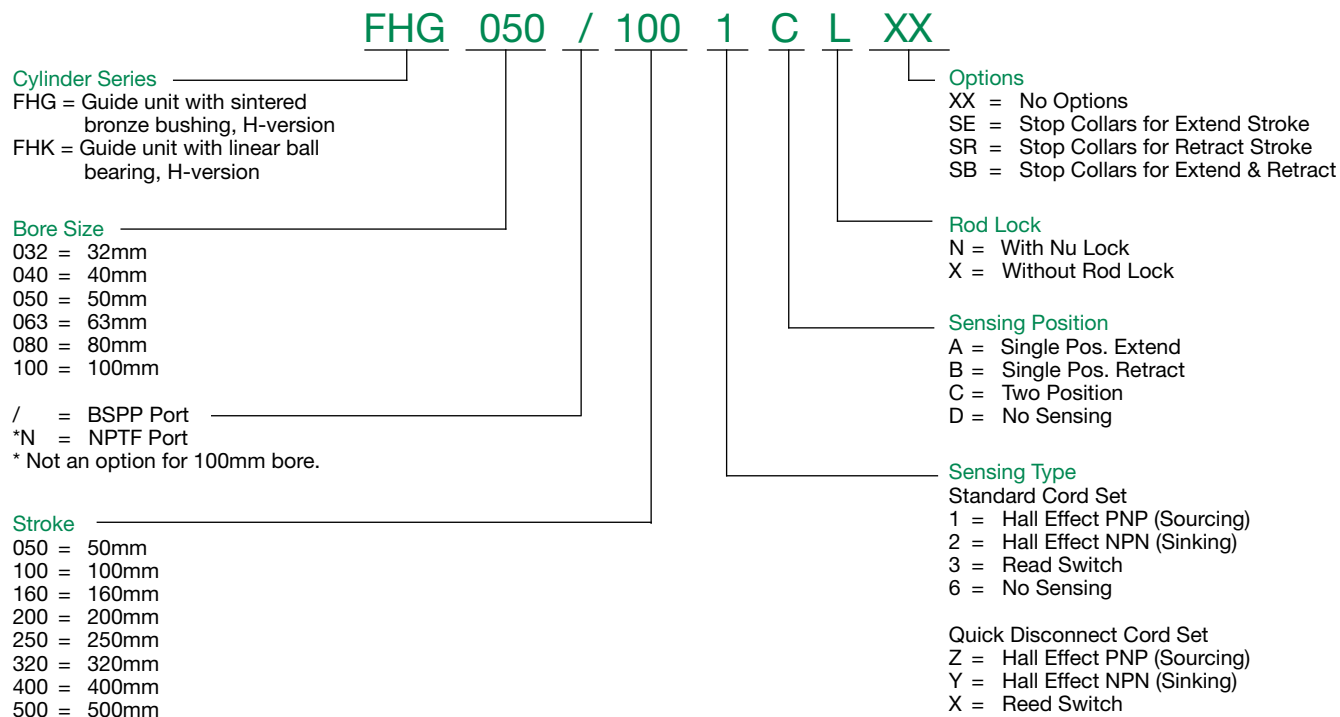


- A. Clear anodized Aluminum Body
- B. Alignment coupler isolates Piston Rod from side loading
- C. The rugged repairable ISO 15552 Series 452 cylinder. Available with RodLock.
- D. Available bearing options include linear ball or bronze bushings.
- E. Precision ground hardened steel guide shafts.



How to Order Complete Guide Units

(Guide Units Include Cylinder)



Order example: **FHG050/1001CLXX**

Part Description: H-Style with bronze bushing, 50 mm bore, BSPP ports 100 mm stroke with Hall PNP switches 2 position and Rodlock, no stop collars.

Weights (kg)

Type FHG; Piston Diameter (mm)	32	40	50	63	80	100
0 mm stroke	1.30	2.40	3.50	4.60	8.40	11.8
To be added per 100 mm stroke	0.17	0.31	0.50	0.50	0.77	0.77

Type FHK; Piston Diameter (mm)	32	40	50	63	80	100
0 mm stroke	1.30	2.40	3.50	4.60	8.40	11.8
To be added per 100 mm stroke	0.17	0.31	0.50	0.50	0.77	0.77

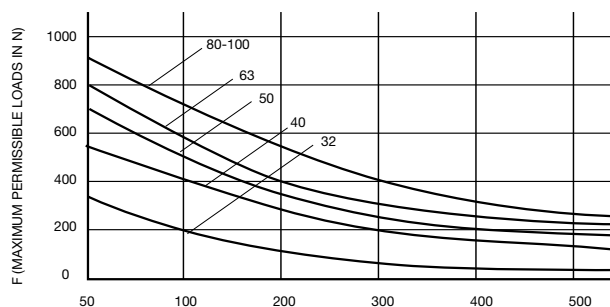
Lbs. = Kg X 2.205

Weights for guide unit only, see page 2 for cylinder weight.

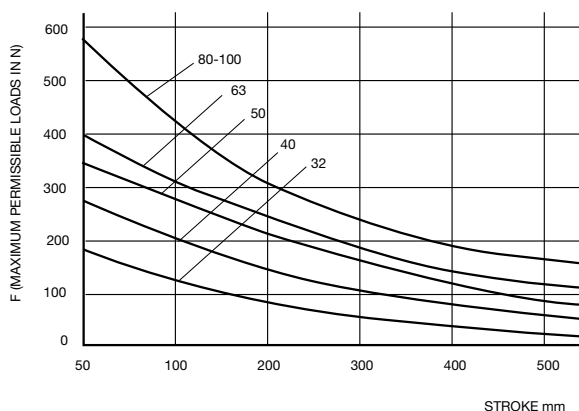


Maximum permissible loads in relation to stroke

FHG Sintered Bronze bushing
Static ratings (Dynamic = load X .5)



FHK Linear Ball
Static ratings (Dynamic = load X .65)



FHG: Guide unit, long, with sintered bronze bushing

FHK: Guide unit, long, with linear ball bearing

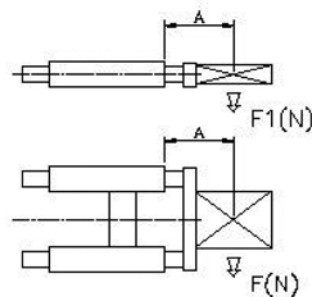
- With short strokes up to 60 mm, a reduction of load with linear ball bearings occurs. This is already taken into account in the diagrams.
- Increasing of max. load by 25 %, results in a reduction of lifetime of linear ball bearing to 2×10^6 m.
- For shock applications with linear ball bearings multiply load capacity by factor 0.5.

FHG: Guide unit, long, with sintered bronze bushing

FHK: Guide unit, long, with linear ball bearing

- The total deflection of the guide rods against rod projection is the sum of deflection by own weight and deflection by load.
- Deflection in function of load is linear (with double load double deflection)

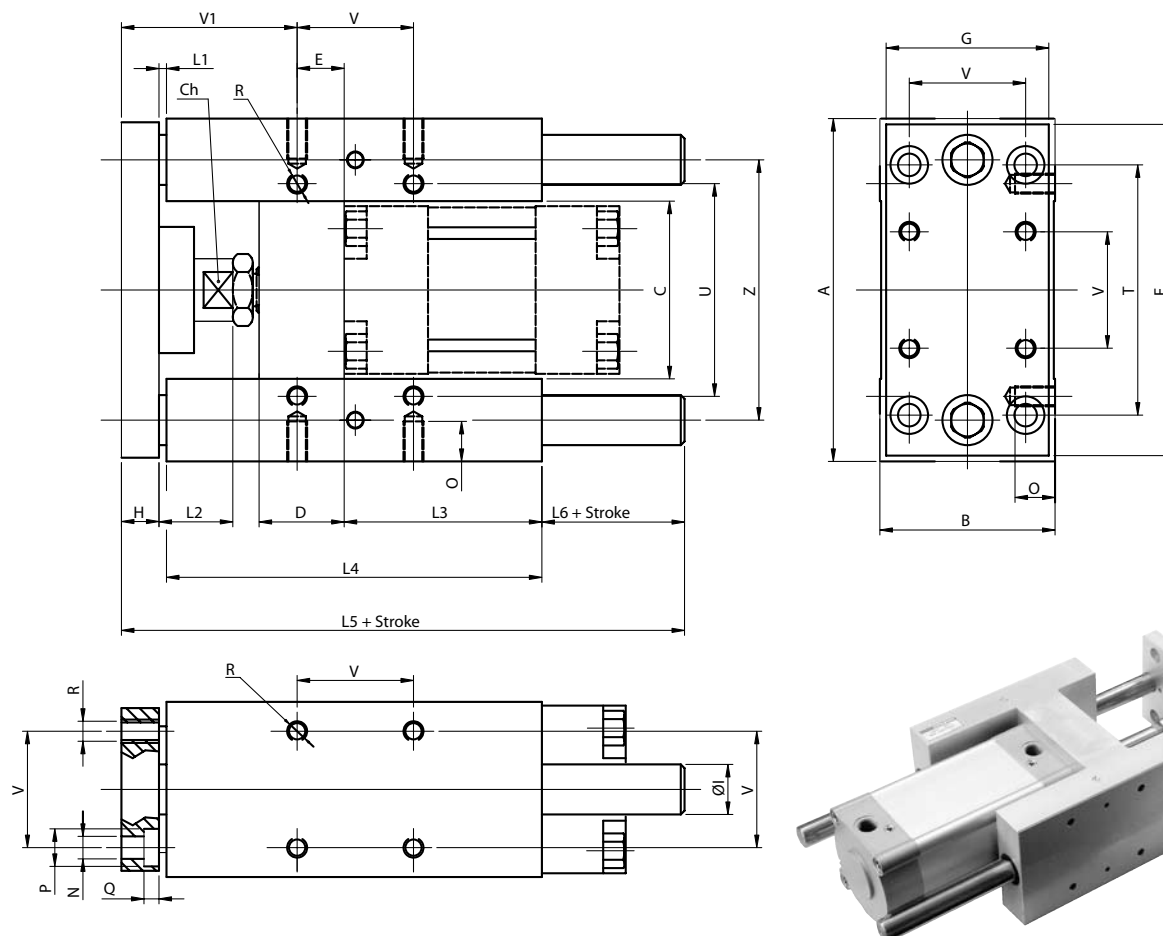
$$F_1 = F \times 0.9N$$





Guide Units

Guide Unit FHG and FHK, version “H” with Sintered Bronze Bushing or Linear Ball Bearing



Dimensions (mm)

Type	Piston Ø	A	B	C	Ch	D	E	F	G	H	ØI	L1*	L2	L3	L4	L5*	L6
FHG/FHK	32	97	49	51	15	24	4.3	93	45	12	12	3	19	75	125	187	47
FHG/FHK	40	115	58	58.2	15	28	11	112	55	12	16	3	24	80	140	207	52
FHG/FHK	50	137	70	70.2	20	34	18.8	134	65	15	20	3	27	78	148	223	57
FHG/FHK	63	152	85	85.2	20	34	15.3	147	80	15	20	3	27	106	178	243	47
FHG/FHK	80	189	105	105.5	26	50	25	180	100	20	25	3	27	111	195	267	49
FHG/FHK	100	213	130	130.5	26	55	30	206	120	20	25	3	27	128	218	290	49

*Add an additional 22 mm when ordered with retract stop collars.

Type	Piston Ø	N	O	P	Q	R	T	U	V	V1*	Z
FHG/FHK	32	6.6	12	11	6.5	M6	78	61	32.5	60.7	74
FHG/FHK	40	6.6	12	11	6.5	M6	84	69	38	64	87
FHG/FHK	50	9	16	15	8.5	M8	100	85	46.5	70	104
FHG/FHK	63	9	16	15	9	M8	105	100	56.5	74.7	119
FHG/FHK	80	11	20	18	11	M10	130	130	72	82	148
FHG/FHK	100	11	20	18	11	M10	150	150	89	83	173



Rod Locks

The **Nu Lock** is a comprehensive rod lock product line that is designed with safety in mind. The cutting edge design allows for effortless load holding during Emergency Stop (E- Stop) conditions. Additionally, it is an OEM type rod locking unit that is specifically designed to give our customers an economical alternative. It is also designed to mechanically lock a cylinder piston rod in the event of an air supply failure. Use caution when applying the Series 452 rod lock unit. It should not be used to “brake” the cylinder piston rod in dynamic conditions. Additionally, the lock must only be applied when movement has ceased.

Standard Specifications:

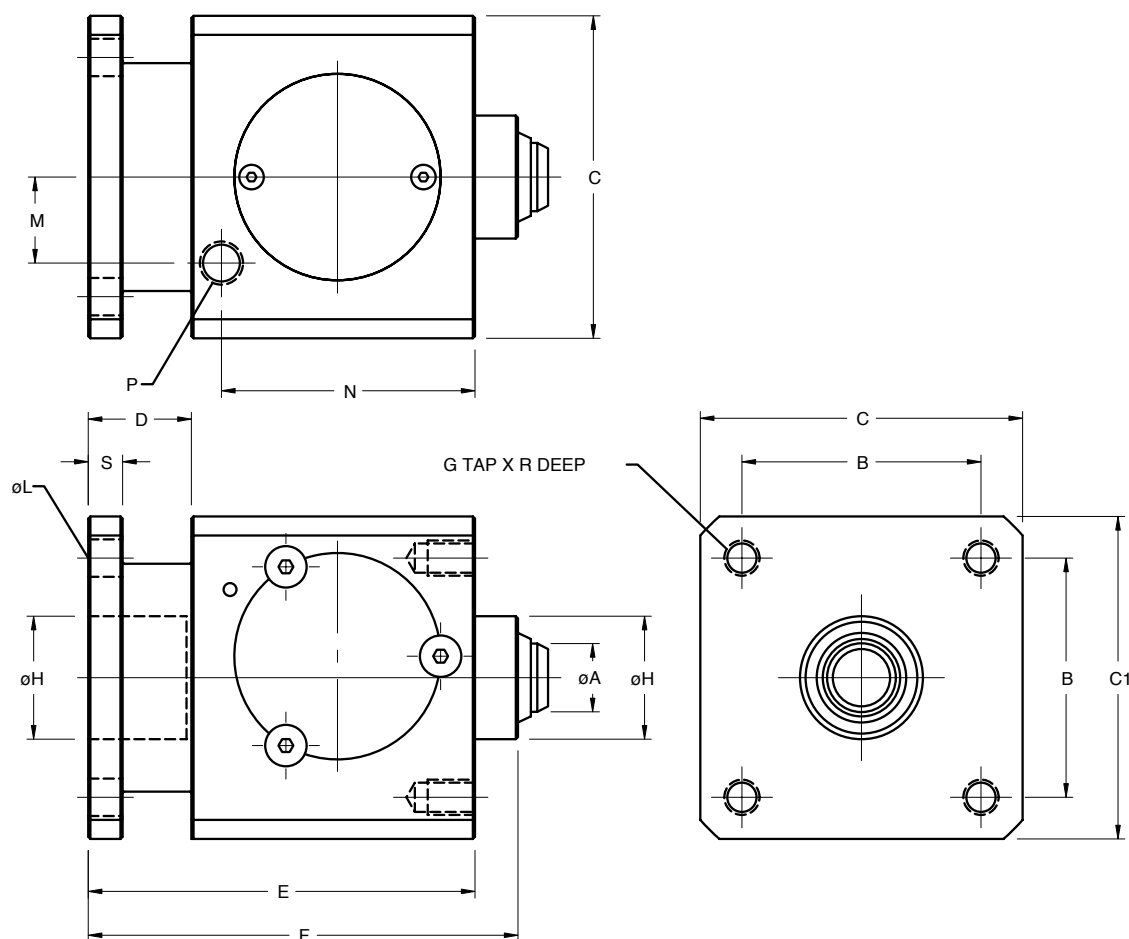
- Economical OEM type rod lock
- Compact profile
- ISO 15552: 32 mm to 100 mm bores
- Minimum unlocking air pressure is 45 psi (3 Bar)
- Maximum unlocking air pressure is 90 psi (6 Bar)
- Clamping force on all Series 452 units is equal to the area of the cylinder piston at 145 psi (10 Bar)
- Temperature rating: -10° F to 165° F

The *Nu Lock* individual locking units are recommended for replacement use only. This particular unit must be used with a chrome plated steel cylinder piston rod. Consult factory for additional details.





Nu Lock



Nu Lock Locking Unit Dimensions (mm)

PART NO.	BORE	ØA*	B	C	C1	E	F	G	ØH	ØL	M	N	P	R	S	WEIGHT kg
BMI/032	32 mm	12.0	32.5	47.0	47.0	60.0	67.5	M6	30.0	6.5	14.5	33.25	1/8" G	8.0	6.0	0.4
BMI/040	40 mm	16.0	38.0	54.0	54.0	70.0	80.0	M6	34.5	6.5	18.0	42.50	1/8" G	8.0	6.0	0.6
BMI/050	50 mm	20.0	46.5	65.0	65.0	90.0	100.0	M8	40.0	9.0	20.0	58.00	1/8" G	12.0	8.0	1.1
BMI/063	63 mm	20.0	56.5	75.0	75.0	90.0	100.0	M8	45.0	9.0	20.0	59.00	1/8" G	12.0	8.0	1.5
BMI/080	80 mm	25.0	72.0	95.0	95.0	110.0	120.0	M10	45.0	11.0	30.0	69.00	1/4" G	16.0	12.0	2.6
BMI/100	100 mm	25.0	89.0	114.0	114.0	110.0	120.0	M10	55.0	11.0	37.0	69.00	1/4" G	16.0	12.0	3.5

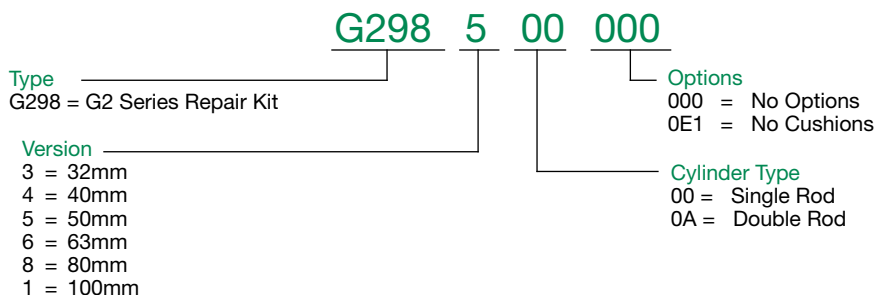
* Dimension denotes cylinder piston rod diameter.



Kit Information

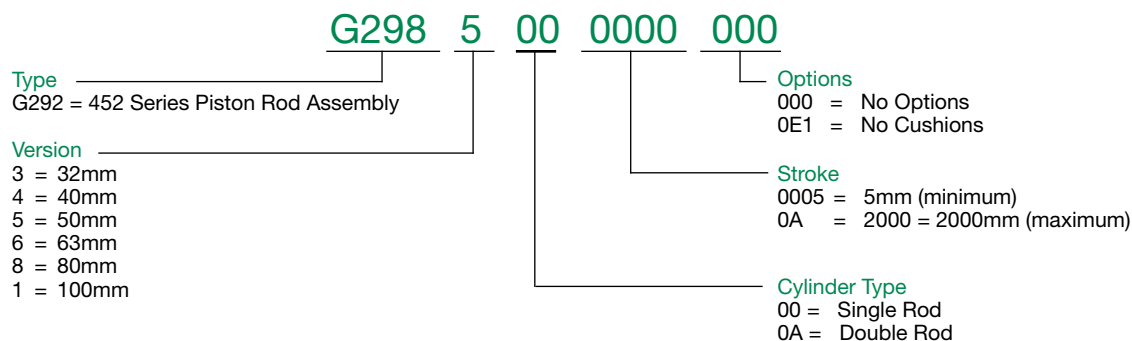
How To Order

Series 452 Repair Kit



Repair kit includes a loaded cylinder head and all seals.

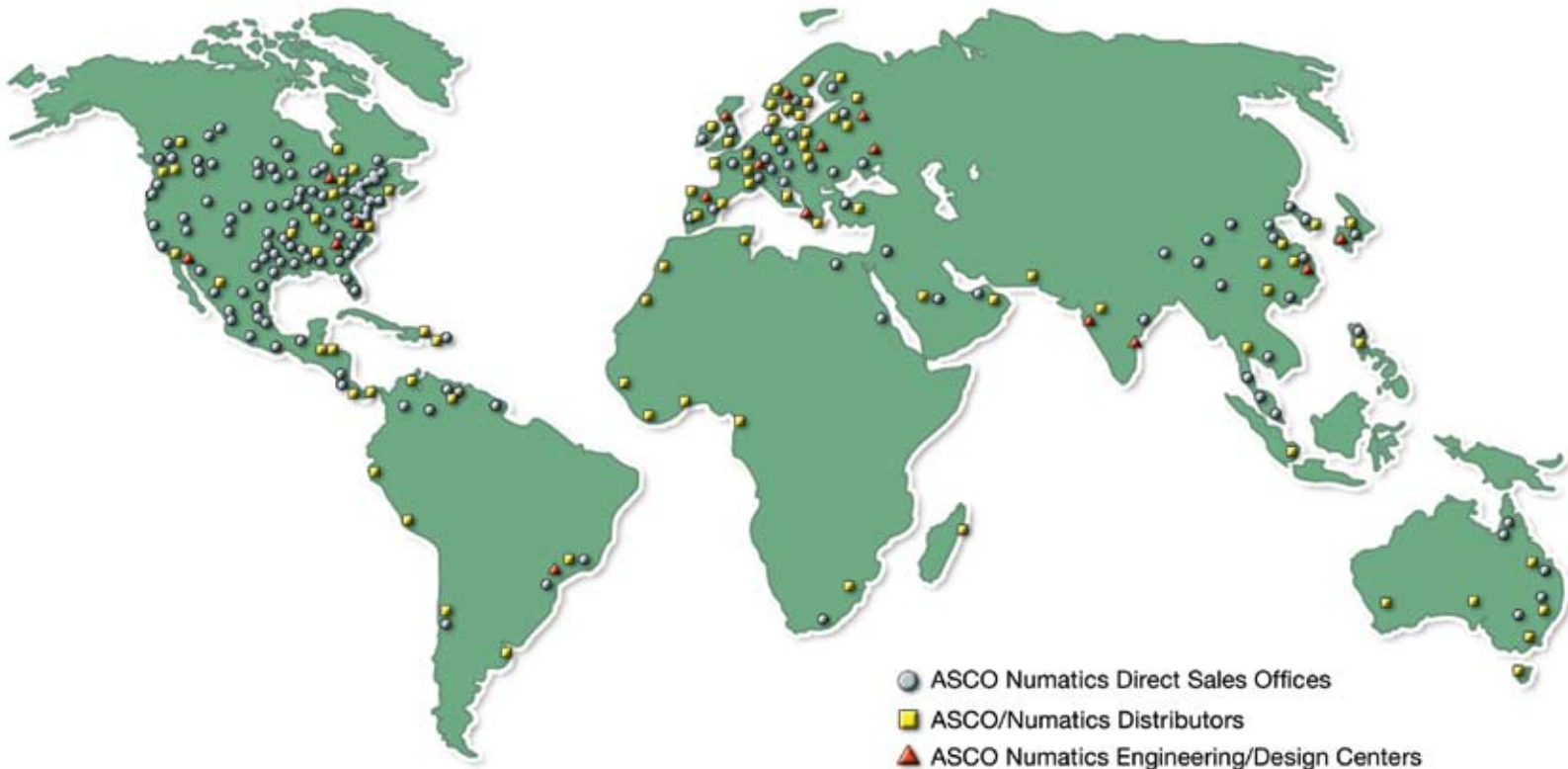
Piston Rod Assembly How to Order



Piston rod assembly includes all piston seals.

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