

FDF Series TWIN-ROD CYLINDER

**Prices effective
September 1, 2011**



Features

1. Magnetic piston is standard in all sizes.
2. Non-rotating design enables precision positioning.
3. Compact design saves space.
4. Suitable for multi-axis assemblies and design of robot arms.
5. Twin bore doubles thrust forces.
6. Easily adjustable sensors mount in linear slots in the housing.
7. Cylinders can be operated with or without lubrication.

Conversions
psi = kgf/cm² x 14.2
psi = MPa x 145
inch = mm x 0.0394
lb force = N x 0.22

Specifications

100 psi max.

Model	FDF
Action	Double acting
Bore Size	ø10, ø16, ø20, ø25
Media	Compressed air
Min. operating pressure	0.1 MPa (1 kgf/cm ²) 14 psi
Max. operating pressure 100 psi	0.7 MPa (7 kgf/cm ²) 100 psi
Maximum speed	500mm/s (19.7 in/sec)
Ambient & media temperature	-10°C(14°F) ~ +70°C(158°F) filtered dry air required at temperatures below 0°C (32°F)
Lubrication	None required or use ISO VG32
Port size	ø10 ~ ø25: M5x0.8
Adjustable retract stroke	0 ~ 5mm
Cushion	Standard with rubber bumper (both sides)

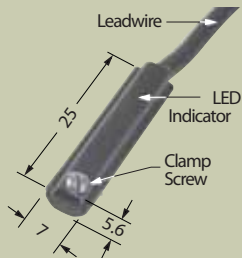
How to order

Series	Bore	Stroke
FDF Standard Type	ø10	10~70mm
	ø16	10~100mm
	ø20	10~100mm
	ø25	10~100mm

Price List

Position Sensors

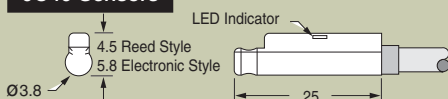
9S49 Sensors



TYPE	Cylinder Stroke (mm)									
	10	20	30	40	50	60	70	80	90	100
FDF 10 x □	\$70.50	\$74.05	\$78.75	\$82.25	\$85.80	\$90.50	\$94.05	-	-	-
FDF 16 x □	82.25	83.40	92.40	101.50	112.20	115.20	119.65	\$124.15	\$130.15	\$134.60
FDF 20 x □	85.80	94.90	105.60	108.30	121.15	124.15	130.15	134.60	139.15	145.05
FDF 25 x □	97.55	99.90	110.10	122.00	124.80	130.25	149.55	154.05	160.00	164.55

See sensor specifications in the selection guides below. Please order sensors and female cordsets separately from the charts below.

9C49 Sensors



All 9C49 sensors feature surge protection, polarity protection, LED indicator, and extremely fast switching speeds

Female Cord Sets	Part No.	Price
1 Meter	CFC-1M	\$15.05
2 Meters	CFC-2M	16.85
5 Meters	CFC-5M	21.30

7 mm wide	9S49 Sensor Selection Guide for all bore sizes ø16 ~ ø25		Prewired 9 ft. Leadwire		Quick Disconnect*	
	Sensor Type	Electrical Characteristics	Part No.	Price	Part No.	Price
	Reed (LED)	5-120 VDC/VAC, 0.03 Amp max, 0.005 Amp min, 4 Watt max, 2.0 voltage drop	9S49-000-002 . . .	\$20.20	9S49-000-302 ..	\$22.85
	Electronic (LED)	Sourcing PNP 5-28 VDC, 0.20 Amp max current, 0.5 voltage drop	9S49-000-031 . . .	33.90	9S49-000-331	36.55
Electronic (LED)	Sinking NPN 5-28 VDC, 0.20 Amp max current, 0.5 voltage drop	9S49-000-032 . . .	33.90	9S49-000-332	36.55	

4 mm round	9C49 Sensor Selection Guide for bore size ø10		Prewired 9 ft. Leadwire		Quick Disconnect*	
	Sensor Type	Electrical Characteristics	Part No.	Price	Part No.	Price
	Reed (LED)	5-120 VDC/VAC, 0.04 Amp Max current, 4 Watt Max., 2.5 voltage drop	9C49-000-002 . . .	\$20.25	9C49-000-302 ..	\$27.00
	Electronic (LED)	Sourcing PNP 6-30 VDC, 0.2 Amp Max current, 6 Watt max., 1.5 voltage drop	9C49-000-031 . . .	28.65	9C49-000-331	33.25
Electronic (LED)	Sinking NPN 6-30 VDC, 0.2 Amp Max current, 6 Watt max., 1.5 voltage drop	9C49-000-032 . . .	28.65	9C49-000-332	33.25	

*Note: All quick disconnect style sensors are supplied with 6 inch pigtail with male connector.
Specifications and prices subject to change without notice or incurring obligation.

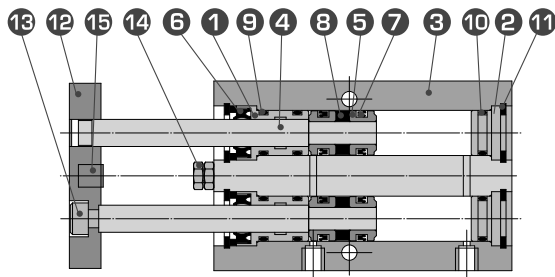
Theoretical Output N (lbf)

*Theoretical output (N)=Pressure (MPa) X Piston area (mm²)

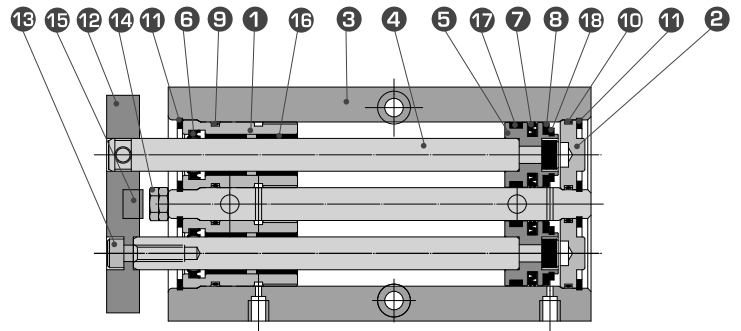
Bore size (mm)	Rod size (mm)	Operating direction	Piston area mm ² (in ²)	Operating pressure MPa (psi)						
				0.1(14.5)	0.2(29)	0.3(43)	0.4(58)	0.5(72)	0.6(87)	0.7(101)
FDF □ 10	6	Push	157(0.24)	15.7(3.5)	31.4(7)	47.1(10)	62.8(14)	78.5(17)	94.2(21)	110(24)
		Pull	100(0.15)	10.0(2.2)	20.0(4.3)	30.0(6.4)	40.0(8.7)	50.0(10)	60.0(13)	70.0(15)
FDF □ 16	8	Push	402(0.62)	40.2(9.0)	80.4(18)	120.6(26)	161(36)	201(44)	241(54)	281(62)
		Pull	301(0.46)	30.1(6.7)	60.2(13)	90.3(19)	120(26)	150(33)	181(40)	211(46)
FDF □ 20	10	Push	628(0.97)	62.8(14)	126(28)	188(41)	251(56)	314(70)	377(84)	440(98)
		Pull	471(0.73)	47.1(10.6)	94.2(21)	141(31)	188(42)	236(52)	283(63)	330(73)
FDF □ 25	12	Push	982(1.52)	98.2(22)	196(44)	295(65)	393(88)	491(109)	589(132)	687(153)
		Pull	756(1.17)	75.6(17)	151(34)	227(50)	302(68)	378(84)	454(101)	529(118)

Construction

FDF 10



FDF 16 - 25



Part lists

NO.	Description	Material	QTY
1	Front end cover	Anodized aluminum alloy	2
2	Rear end cover	Anodized aluminum alloy	2
3	Housing	Anodized aluminum alloy	1
4	Piston rod	Hard chrome plated stainless steel	2
5	Piston	∅10 Brass	4
		∅16~25 Aluminum alloy	2
6	Piston rod seal	Nitrile - Buna N	2
7	Piston seal	∅10 Nitrile - Buna N	4
		∅16~25 Nitrile - Buna N	2
8	Magnet	Rubber bonded barium ferrite	2
9	Front end cover seal	∅10 Nitrile - Buna N	4
		∅16~25 Nitrile - Buna N	2
10	Rear end cover seal	Nitrile - Buna N	2
11	Snap ring	Plated carbon steel	4
12	End plate	Plated steel	1
13	Set screw	Carbon steel	2
14	Nut	Carbon steel	2
15	Bumper	Acetal	1
16	Sleeve bearing	Oil filled, sintered bronze	2
17	Wear ring	Acetal	2
18	Washer	Stainless steel	2

Seal Kits

Bore	Part Number	Price
10	FDF10-SK	\$22.25
16	FDF16-SK	\$12.30
20	FDF20-SK	\$12.60
25	FDF25-SK	\$13.65

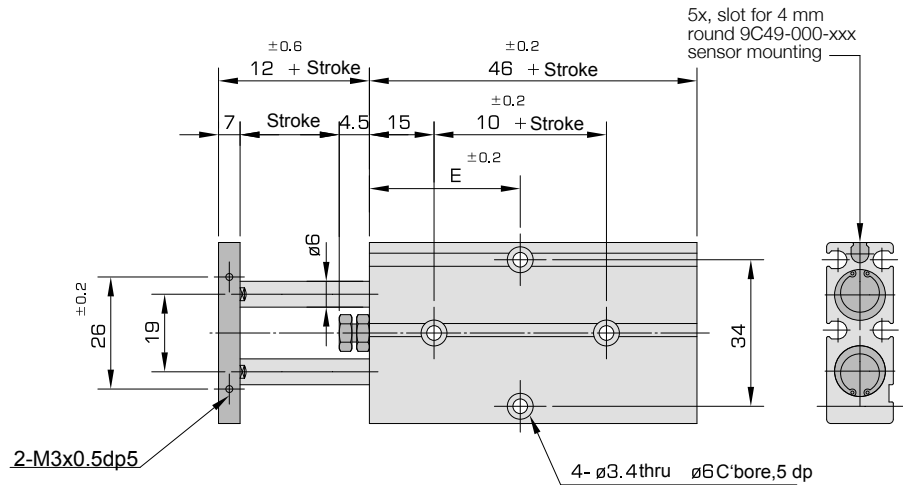
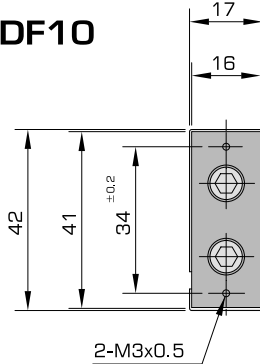
Standard strokes (mm)

Bore	Stroke
∅10	10,20,30,40,50,60,70
∅16	10,20,30,40,50,60,70,80,90,100
∅20	10,20,30,40,50,60,70,80,90,100
∅25	10,20,30,40,50,60,70,80,90,100

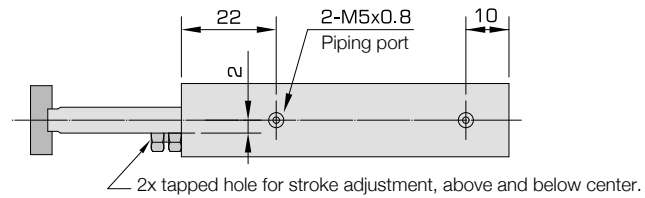
FDF Series TWIN-ROD CYLINDER

External Dimensions (mm)

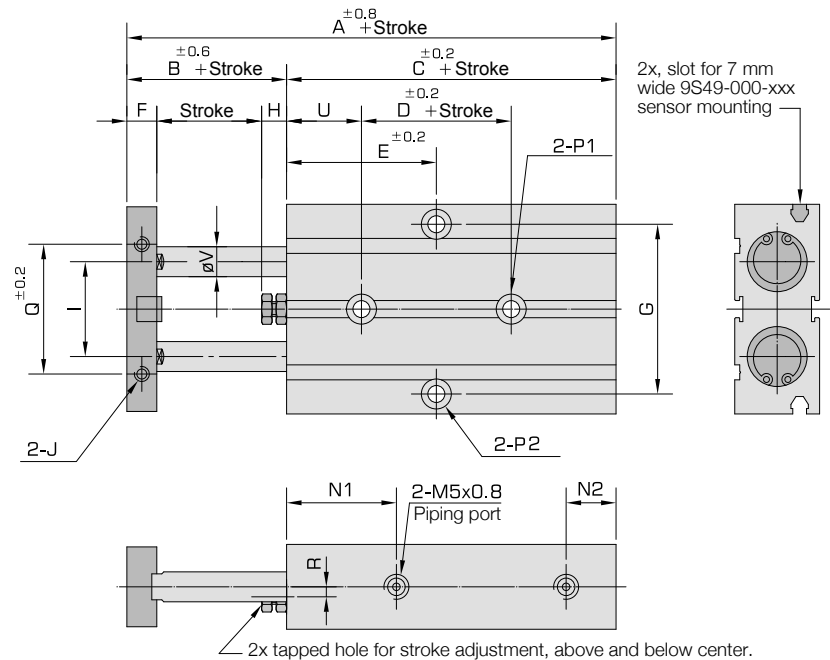
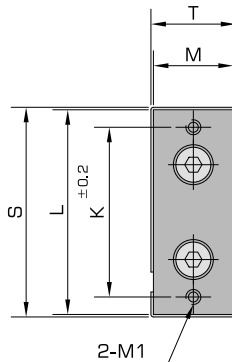
● FDF10



Stroke Bore	Dim.		E						
	10	20	30	40	50	60	70		
Ø10	30	30	35	40	45	50	55		

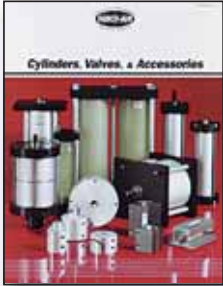


● FDF16~25



Stroke Bore	Dim.	E													F	G	H	I	J	K	L	M	
		A	B	C	D	10	20	30	40	50	60	70	80	90									100
Ø16		67	14	53	20	30	35	40	45	50	55	60	65	70	75	8	47	6	24	M4X0.7dp5	47	53	20
Ø20		75	17	58	20	35	35	40	45	50	55	60	65	70	75	10	55	6.5	28	M4X0.7dp5	55	61	24
Ø25		79.5	17.5	62	30	40	40	45	50	55	60	65	70	75	80	10	70	7.5	40	M5X0.8dp6	66	72	29

Bore	Dim.	P1			P2			Q	R	S	T	U	V
		M1	N1	N2	P1	P2							
Ø16		M4X0.7	22	10	φ4.5Thruφ8C'bore,dp 7.2	φ4.5Thruφ8C'bore,dp 4.4	34	4	57	21	15	8	
Ø20		M4X0.7	24	12	φ4.5Thruφ8C'bore,dp 7.2	φ4.5Thruφ8C'bore,dp 4.4	44	6	65	25	15	10	
Ø25		M4X0.7	27	12	φ4.5Thruφ8C'bore,dp 7.2	φ4.5Thruφ8C'bore,dp 4.4	56	5	80	30	15	12	



Cylinders, Valves and Accessories
 Catalog #CV9



Pancake® II Air Cylinders
 Catalog Pan2-2



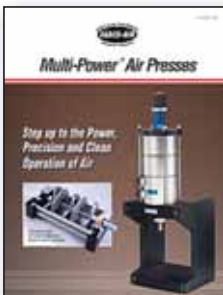
Square Pancake® II Air Cylinders
 Catalog # SqPan2



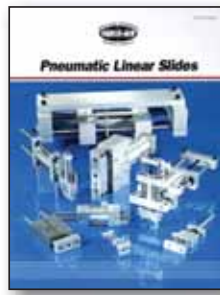
ISO 6431 Cylinders
 Catalog # FAQR-09



Pneumatic Angular Motion Grippers
 Catalog # FKA-09



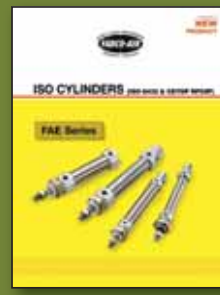
Multi-Power® Air Presses
 Catalog # FP16



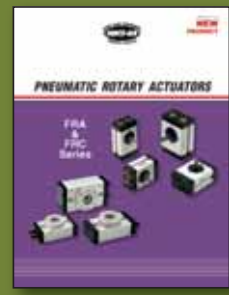
Linear Slides - 6 Families
 Catalog # LS-03



Pneumatic Grippers, Parallel Jaw and Angular Motion – Catalog # GR-8



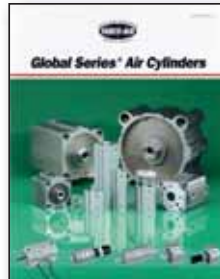
ISO 6432 Cylinders
 Catalog # FAE-09



Rotary Actuators, Pneumatic
 Catalog # FRA.C-09



NFPA Interchangeable Air Cylinders – Catalog # NF-6



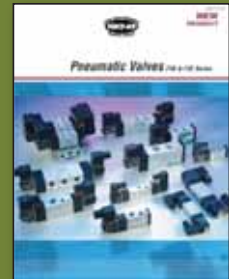
Global Series™ Metric Air Cylinders - Catalog # GC-15



Swing Clamps Bulletin # SC-DB04



Manifold Solenoid Valves
 Catalog # FVS.Y-09



Air Pilot & Solenoid Valves
 Catalog # FVA.E-09



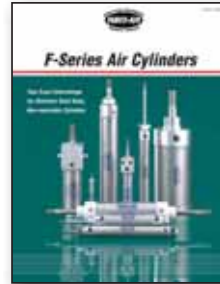
Modular Air Preparation System - FRLs
 Catalog # FRL-06



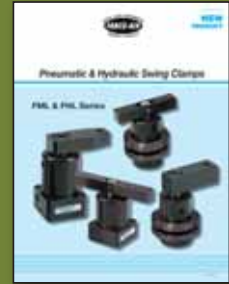
Specialty & Control Valves
 Catalog # 14CAN



Stopper Cylinders
 Catalog # ST-SC



Stainless Steel Body Air Cylinders
 Catalog # SSB-03



Pneumatic & Hydraulic Swing Clamps
 Catalog # FML.H

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