

ML SERIES

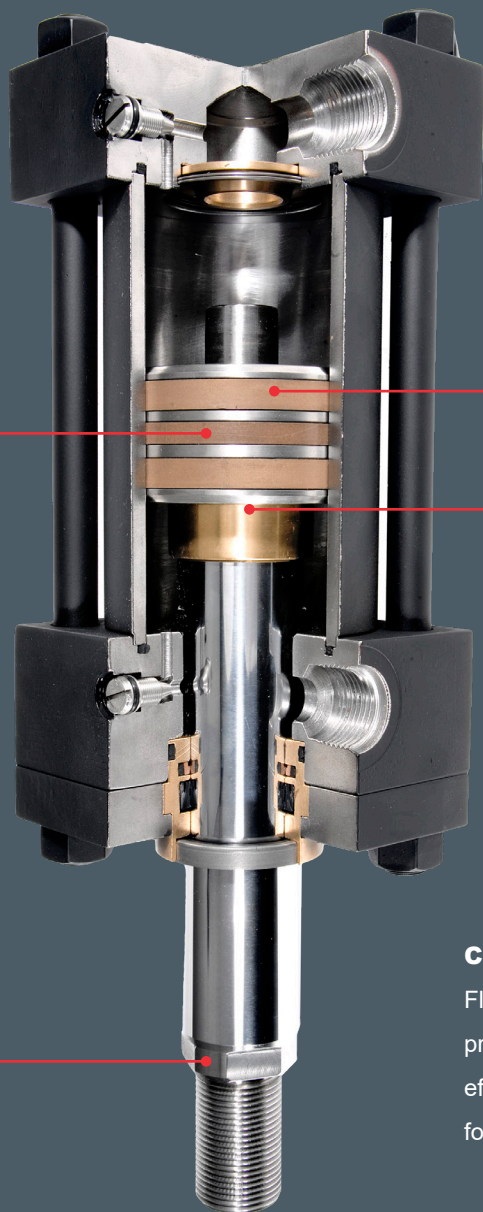
Double-Acting Hydraulic Valve Actuator

Designed & Engineered for Severe-Service Applications

- Thrusts up to 1,500,000 lbs
- SIL-3 Capable
- GT3 Triple Seal Gland for Severe Service Applications

Design & Materials

*Cushions shown are optional



**High Strength Nylon
Wear Rings** | BZ-PTFE
for high temp version

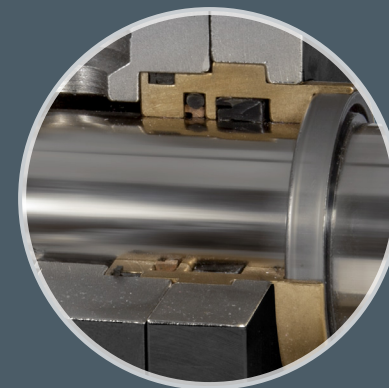
High Load Piston Seal
Standard | Excellent wear
resistance and sealing

Piston Rod Flats
4 wrench flats for easy
installation

Cushion Plunger (Optional)
Floating Cushion plunger
provides maximum cushioning
effect combined with a quick start
for optimum performance

Material Breakdown	STANDARD	Stainless Steel Material Option
Head & cap	Machined Steel	316
Barrel	Honed Seamless Steel Tubing *Optional Chrome Plating available	Application Dependent <i>Consult Factory</i>
Piston	Ductile Iron	Ductile Iron
Piston rod	1045	17-4 PH
Gland	SAE 660 Bronze	SAE 660 Bronze
Tie Rod	Stress-proof Steel	17-4 PH

Gland Seal Configuration



Triple Seal Gland Standard

Gland Bushing: Cartridge type, no special tools required for removal

Buffer Seal: Protects primary seal from pressure spikes. PTFE for low friction and long service life.

Primary Seal: Heavy Duty Polyurethane "U"-cup for excellent seal ability and long service life.

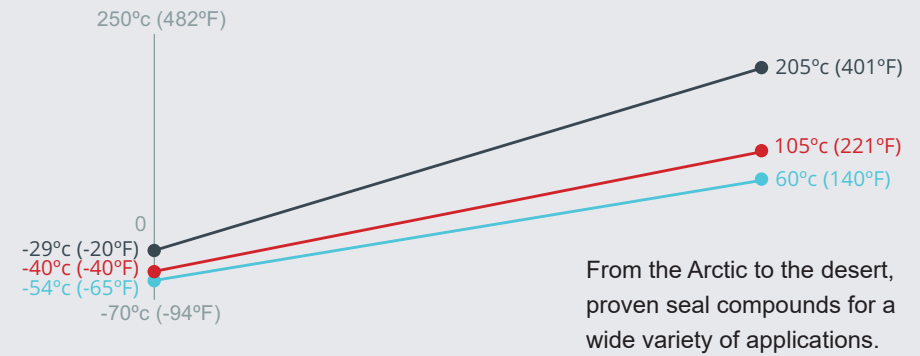
Encased Rod Wiper: Rugged wiper deflects contamination away for the rod seals for long service.

Specifications

Cowan ML Series Double-Acting Hydraulic Valve Actuators are designed to suit a wide range of applications; from commodity to severe-service extremes.



Canadian Oil Sands Tailings Application
8" Bore ML Series



- **Thrust: up to 1,500,000 lbs**
- **Bore Size: 1½"-24"**
- **Configuration: Single-Stage and Tandem**
- **Stroke Range: Up to 144"**
- **Pressure Rating: 3000 psi**
- **Rod Size: 1"-10"**

Add-Ons



8" Bore ML Series with low temp seals

Mounting Kits: ISO, MSS & Customized Patterns Available

Cowan valve mounting kits can be designed for any linear valve.

Mounting kits available in steel and stainless steel construction.



Anti-Rotation Torque Arm:

Maintains constant alignment between valve stem and cylinder piston-rod. Compatible with rotary type switch boxes and beacons.

Field-Adjustable Travel Stops:

to limit stroke for position-seated or limited-travel applications. Ensures valve reaches positive sealing every time without damage to valve internals



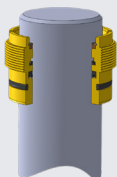
Limit Switches

Mechanical Limit Switch SPDT, for Open & Close Indication. Inductive switches also available. Solid State, Reed and inductive type also available. Specify brand and part number



Available in 316 Stainless Construction

for corrosive applications. Includes attachments such as Rod clevis and Eye brackets.



GT3 Gland for Harsh Environments

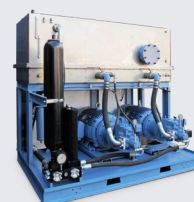
Triple-seal gland with dual wipers. Rugged metallic scraper and urethane double-acting wiper deflect contamination away from the rod seal for long service life.

- Low Temp
- Cast iron construction for applications where yellow metals are not allowed



Manual Hand Pump

Hydraulic manual override with indicator



HPU and Gas/Oil System available.

Standard and custom units engineered to customer specifications and applications.

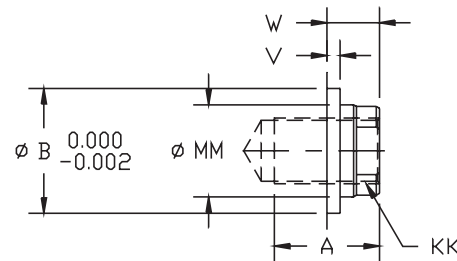


Rod Thread Size

1½" - 6" Bore

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World's Most Challenging Environments

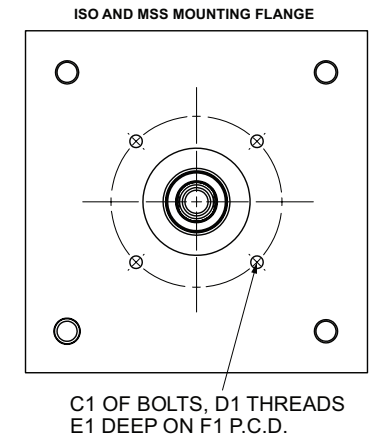
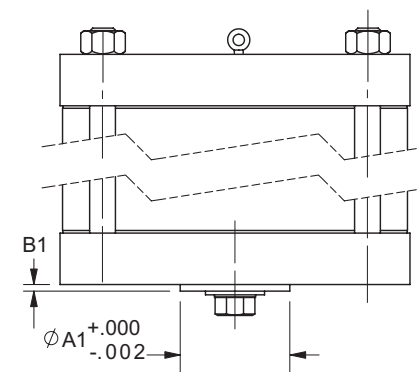
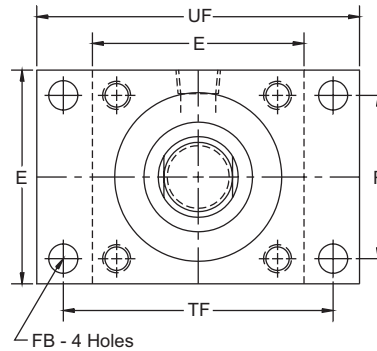
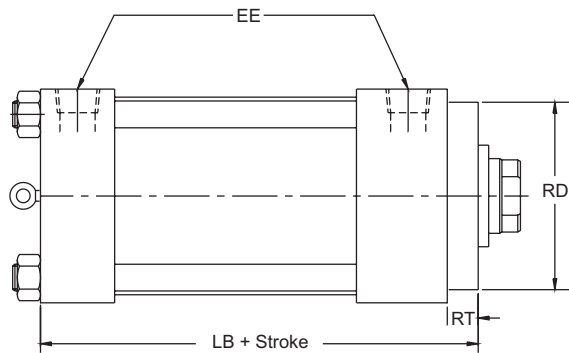
SMALL FEMALE ROD END



Dimensions (in)						
Bore	Rod Ø MM	KK	A	B	V	W
1½	0.63	7/16-20	0.75	1.13	0.25	0.63
2	1.00	¾-16	1.13	1.50	0.25	0.75
2½	1.00	¾-16	1.13	1.50	0.25	0.75
3¼	1.38	1-14	1.63	2.00	0.25	0.88
4	1.75	1¼-12	2.00	2.38	0.25	1.00
5	2.00	1½-12	2.25	2.63	0.25	1.13
6	2.50	1⅞-12	3.00	3.13	0.25	1.25
7	3.00	2¼-12	3.50	3.75	0.25	1.25
8	3.50	2½-12	3.50	4.25	0.25	1.25
10	4.50	3¼-12	4.50	5.25	0.25	1.50
12	5.50	4-12	5.50	6.25	0.25	1.50
14	7.00	5-12	7.00	8.00	0.38	1.56

Actuator Dimensions: 1½"– 8" Bore

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Dimensions (in)										
BORE	E	EE		FB	R	TF	UF	LB	RD	RT
		NPT	SAE							
1½	2.50	0.50	10	0.44	1.63	3.44	4.25	5.00	2.13	0.38
2	3.00	0.50	10	0.25	2.05	4.13	5.13	5.25	2.50	0.38
2½	3.50	0.50	10	0.25	2.55	4.63	5.63	5.38	2.50	0.38
3¼	4.50	0.75	12	0.69	3.25	5.88	7.13	6.25	3.00	0.63
4	5.00	0.75	12	0.69	3.82	6.38	7.63	6.63	3.50	0.63
5	6.50	0.75	12	0.94	4.95	8.19	9.75	7.13	4.00	0.75
6	7.50	1.00	16	1.06	5.73	9.44	11.25	8.38	4.50	0.88
7	8.50	1.25	20	1.19	6.58	10.63	12.63	9.50	5.25	0.63
8	9.50	1.50	24	1.19	7.50	11.81	14.00	10.50	5.75	0.63

MSS Flange Mounting Dimensions (in)							
MSS FLANGE	MAX. THRUST (lbs.)	A1	B1	C1	D1	E1	F1
FA07	4,500	2.10	0.12	4	5/16-18	1 1/16	2.75
FA10	9,000	2.30	0.12	4	3/8-16	1 1/16	4.00
FA14	25,000	3.75	0.16	4	5/8-11	1 3/16	5.50
FA16	35,000	5.00	0.19	4	3/4-10	1 1/8	6.50
FA25	50,000	6.00	0.19	8	5/8-11	1 1/8	10.00
FA30	75,000	7.00	0.19	8	3/4-10	1 1/8	11.75
FA35	140,000	8.50	0.19	8	1-8	1 1/4	14.00
FA40	230,000	9.00	0.32	8	1 1/4-7	1 1/2	16.00

Consult factory for more detailed
dimensions

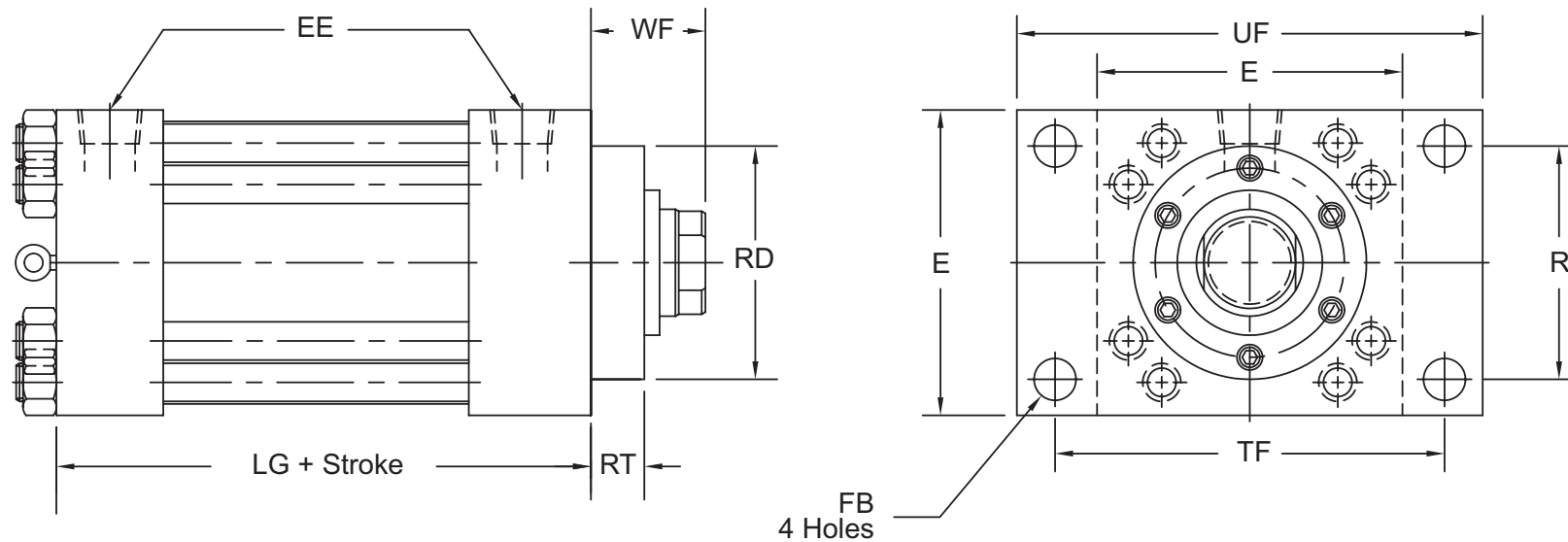
*Other Mounting Patterns are available;
consult factory

Thrust Values (lbs)						ISO or MSS Mounting Pattern*	
BORE	Rod Ø MM	1500 PSI		3000 PSI		STD	OPT
		EXTEND	RETRACT	EXTEND	RETRACT		
1½	0.63	2,650	2,190	5,300	4,380	F/FA10	F/FA07
2	1.00	4,710	3,540	9,420	7,070	F/FA14	F/FA10
2½	1.00	7,360	6,190	14,720	12,370	F/FA14	F/FA10
3¼	1.38	12,440	10,220	24,880	20,430	F/FA14	F/FA10
4	1.75	18,840	15,240	37,680	30,470	F/FA25	F/FA16
5	2.00	29,440	24,730	58,880	49,460	F/FA30	F/FA25
6	2.50	42,390	35,040	84,780	70,070	F/FA35	F/FA30
7	3.00	57,700	47,100	115,400	94,200	F/FA35	F/FA30
8	3.50	75,360	60,940	150,720	121,880	F/FA40	F/FA35

ISO Flange Mounting Dimensions (mm)							
ISO FLANGE	MAX. THRUST (N)	A1	B1	C1	D1	E1	F1
F07	19,995	55	3	4	M8	11	70
F10	39,990	70	3	4	M10	16	102
F14	99,996	99	4	4	M16	19	140
F16	150,007	130	5	4	M20	22	165
F25	200,010	200	5	8	M16	22	254
F30	325,014	229	5	8	M20	22	297
F35	700,034	260	5	8	M30	22	356
F40	1,100,054	300	8	8	M36	22	406

Actuator Dimensions: 10"– 14" Bore

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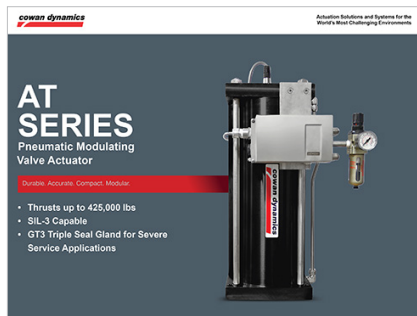
Dimensions (in)											
BORE	E	EE		FB	R	TF	UF	LG	RD	RT	WF
		SAE	SAE-61								
10	12.63	24	2.00	1.81	9.89	15.88	19.00	12.13	8.25	1.44	2.94
12	14.88	24	2.50	2.06	11.75	18.50	22.00	14.50	9.38	1.69	5.38
14	17.13	24	2.50	2.31	12.90	21.00	25.00	15.63	10.50	1.94	5.88

Consult factory for more detailed dimensions and larger sizes
*Other Mounting Patterns are available; consult factory

Thrust Values (lbs)					
BORE	Rod Φ MM	1500 PSI		3000 PSI	
		EXTEND	RETRACT	EXTEND	RETRACT
10	4.50	117,750	93,910	235,500	187,820
12	5.50	169,560	133,950	339,120	267,890
14	7.00	230,790	173,100	461,580	346,190

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