

Hydraulic Cylinders  
Streamline Welded  
WCG Series &  
Telescopic Series



**HYDRO DYNE**  
**INDUSTRIES**

Total Fluidpower Performance

## DESIGN FEATURES & MATERIALS

Hydrodyne WCG series STREAMLINE WELDED CYLINDERS are designed for compactness, based on many years of experience in manufacture of heavy duty hydraulic cylinders suited for industrial and, in particular mobile application where space is normally a limitation.

### THE GLAND

Gland can be externally removed without disassembly of the cylinder. Its long bearing surface is inboard of the seal assuring positive lubrication from within the cylinder. Leak proof gland seals consists of :

- Polyurethane / low friction nitrile seal completely self compensating and self relieving to withstand all pressure variations and mechanical deflections that may occur.
- Secondary seal - Hydro dyne wiper seal performs a double service by wiping clean any oil film adhering to the rod on the advance stroke, and cleaning the dirt off the rod on return stroke

A static 'o'ring seal is used to seal between the gland & head and to serve as a prevailing torque lock .

### THE PISTON

The piston is of one piece construction manufactured from fine grain cast iron or steel ,dependent upon the piston seal requirements. The standard , piston seal is a double acting elastomeric seal .

The wide piston surface considerably reduces bearing loads and wear during mechanical deflection . long thread engagement with the with piston rod provides greater shock absorption ,and the piston is permanently locked with a pin .

### THE CAP END

The cap end is manufactured from medium carbon steel and is welded to the tube end. The cap ends is sufficiently long to provide long cushion lengths when required. The cap end port is machined in the cap end on counter faced perpendicular surface. Flow passages of large size are provided to avoid pressure drop, For optional cushioning, adjustable needle and check valve flush with the cap end

### THE PISTON ROD

Piston rod are made from high tensile medium ,carbon steel ground and hard chrome plated to thickness of 25 microns and surface finish to 0.5um or better in special case (with prior acceptance) the piston rod are induction hardened for long life dent resistance surface .

### THE CYLINDER BODY

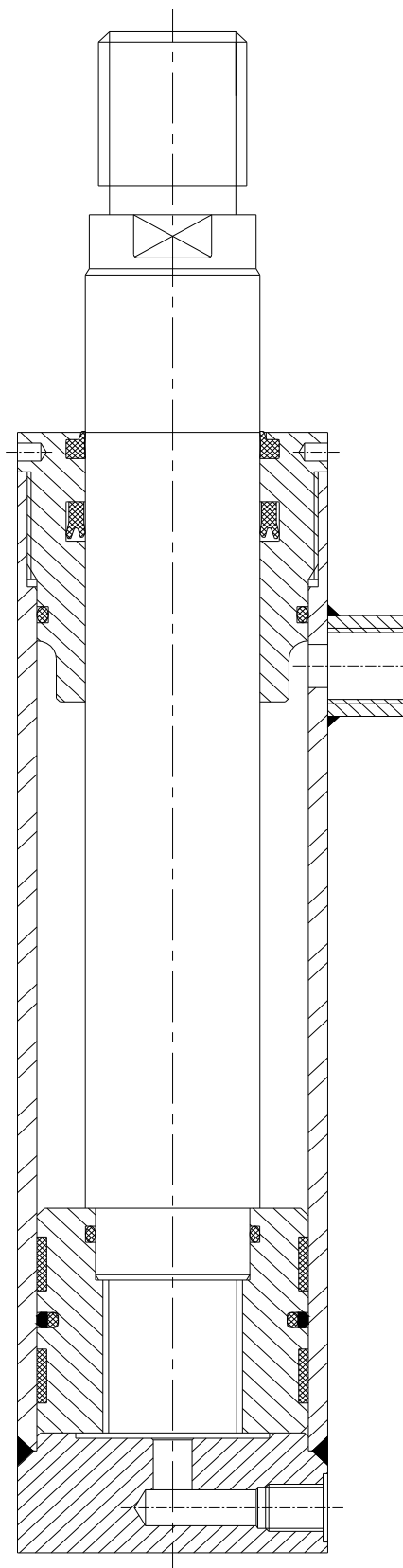
The cylinder is made from heavy wall steel tubing ,honed to a micro-finish bore . Normally, all major welding on the tube are done before the honing. The gland threads on the tube ID are machined after honing to ensure concentricity between the piston, rod, and the tube bore.

### PORTS

Extra size ports are designed for low pressure drops for oil flow. Normally, at gland side, the port is welded and on the cap end the port is machined on the cap end. Optionally extended port is provided on the cap end also.

### THE SEALS

All dynamic ,elastomeric seals used with series WCG cylinders are design to seal with minimum friction under varying pressure .This together with fine finishes on the cylinder bore and piston rod,provide long seal life .

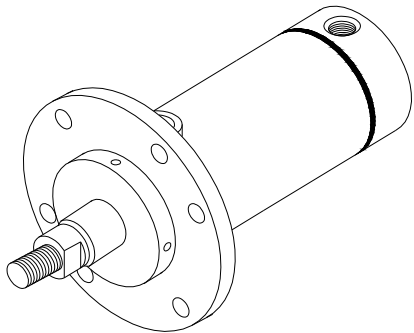


**WCG SERIES HIGH PRESSURE WELDED TYPE HYDRAULIC CYLINDER**

**SPECIFICATIONS**

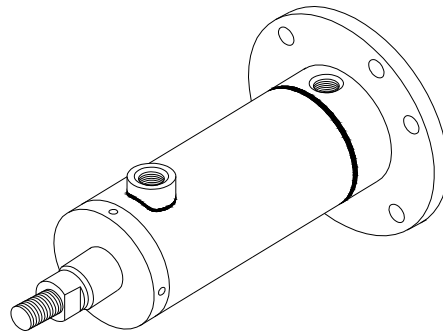
- 1. MAX. OPERATING PRESSURE --- 160 BAR (standard)  
210 BAR (upon request)
- 2. TEMPRATURE --- -20°C to +80°C with standard nitrile/polyurethane seals.  
Higher temperature with viton/teflon seals.
- 3. MEDIUM --- Mineral oil  
Cylinders to oprate with water based fluids available on request.

**Front Flange Mounting  
HDI Model FF**



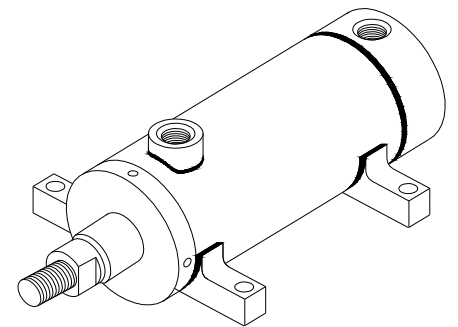
**FF**

**Rear Flange Mounting  
HDI Model FR**



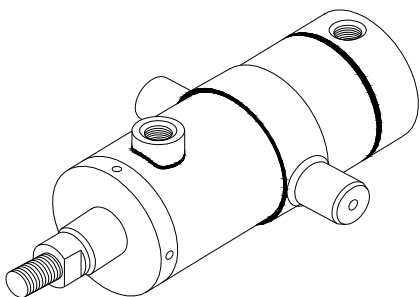
**FR**

**Foot Lug Mounting  
HDI Model LE**



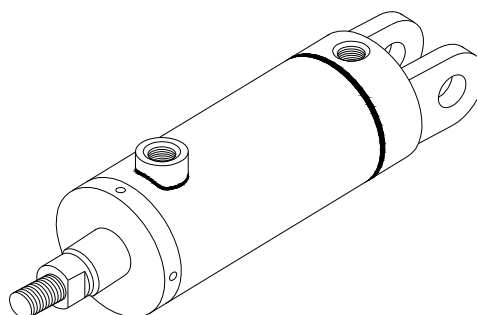
**LE**

**Intermediate Trunion Mounting  
HDI Model UM**



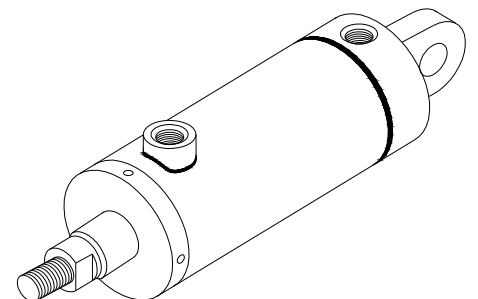
**UM**

**Rear Flange Mounting  
HDI Model CF**



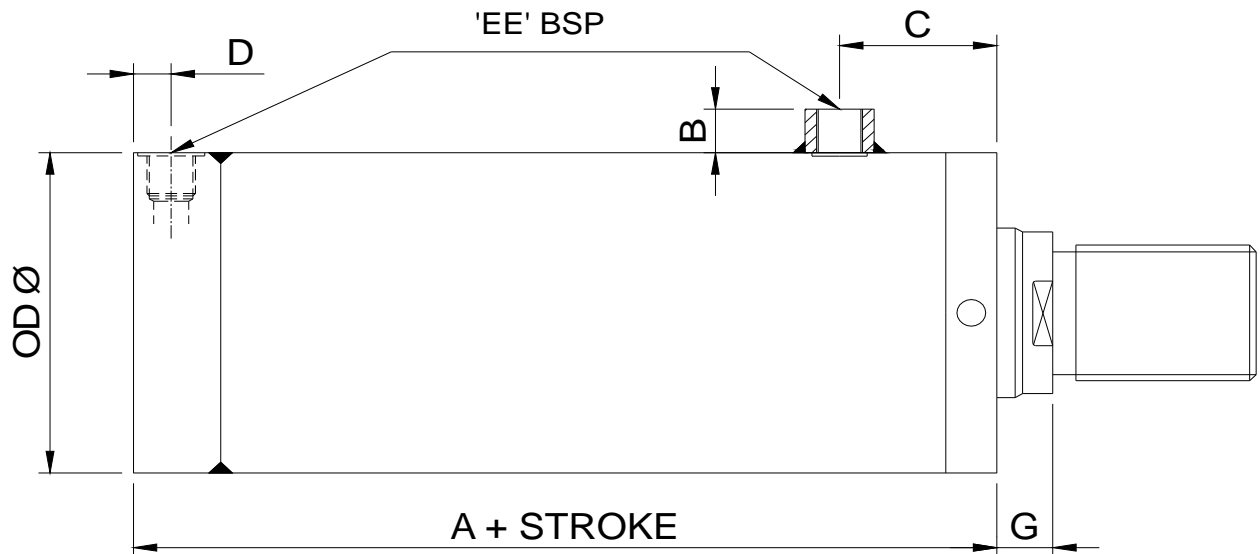
**CF**

**Foot Lug Mounting  
HDI Model CM**



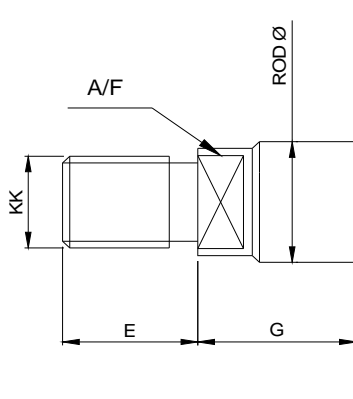
**CM**

**WCG THREADED GLAND TYPE CYLINDER (WCG)**  
**BASIC CYLINDER DIMENSIONS**



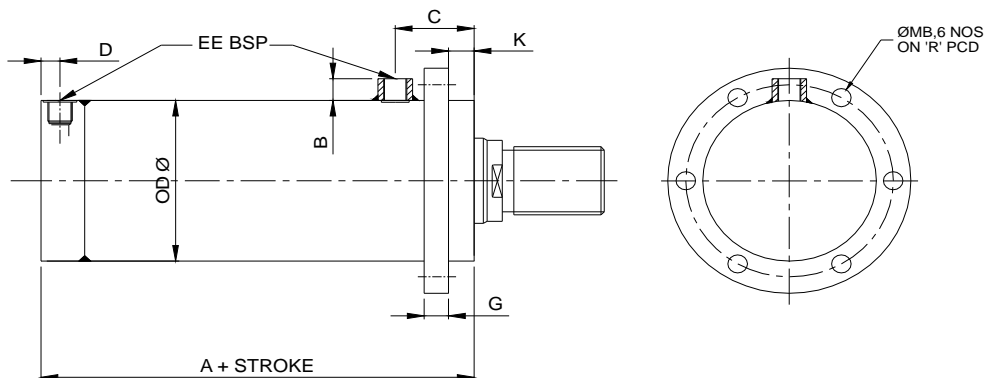
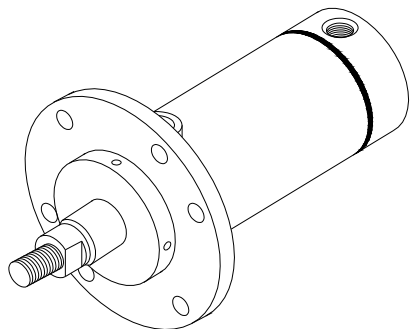
BOREØ	A	B	C	D	'EE' BSP	OD Ø
40.0	135.0	18.0	57.0	16.0	1/2"	50.0
50.0	154.0	18.0	60.0	16.0	1/2"	62.0
63.0	167.8	18.0	68.0	16.0	1/2"	76.0
80.0	195.8	20.0	77.0	19.0	3/4"	93.0
100.0	212.8	20.0	81.0	19.0	3/4"	114.0
125.0	222.8	20.0	88.0	19.0	3/4"	140.0
160.0	259.8	22.0	103.0	23.5	1"	179.0

**Rod End Dimensions**

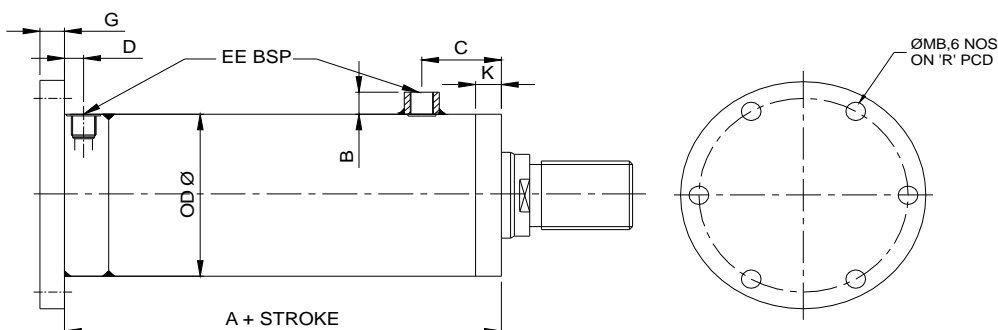
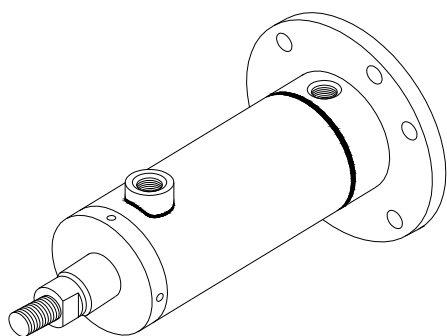


BOREØ	STANDARD	RODØ	A/F	G	KK	E
40.0	STD 1	18.0	15.0	12.0	M14X1.5	18.0
	STD 2	22.0	18.0	12.0	M16X1.5	22.0
50.0	STD 1	25.0	20.0	14.0	M20X1.5	28.0
	STD 2	28.0	22.0	14.0	M20X1.5	28.0
63.0	STD 1	28.0	22.0	16.0	M20X1.5	28.0
	STD 2	36.0	30.0	16.0	M27X2	36.0
80.0	STD 1	36.0	30.0	18.0	M27X2	36.0
	STD 2	45.0	39.0	18.0	M33X2	45.0
100.0	STD 1	45.0	39.0	20.0	M33X2	45.0
	STD 2	56.0	48.0	20.0	M42X2	56.0
125.0	STD 1	56.0	48.0	23.0	M42X2	56.0
	STD 2	70.0	62.0	23.0	M52X2	70.0
160.0	STD 1	70.0	62.0	25.0	M52X2	70.0
	STD 2	90.0	80.0	25.0	M68X3.0	90.0

Front Flange Mounting  
HDI Model FF



Rear Flange Mounting  
HDI Model FR



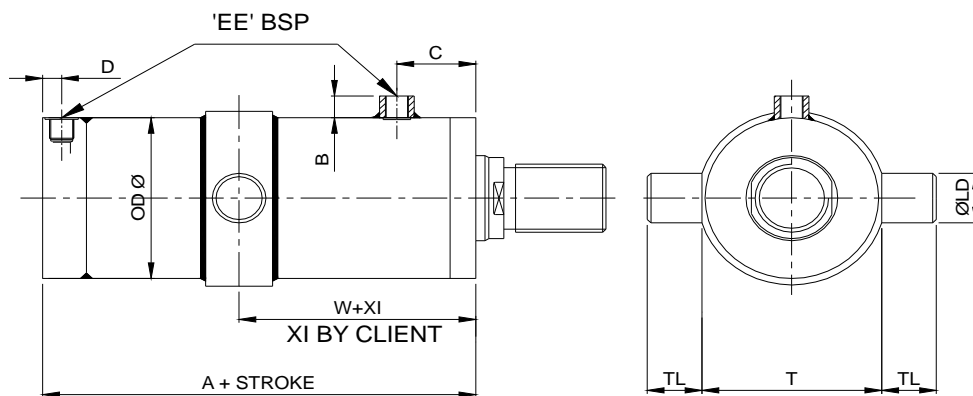
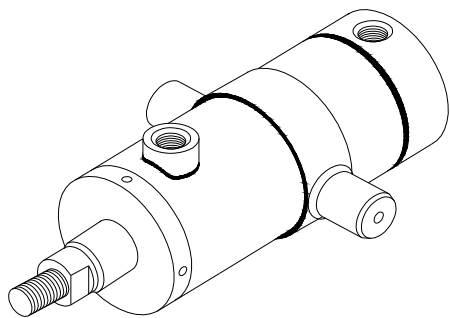
Dimensions - FF & FR

For Rod End Dimensions - see Page 4

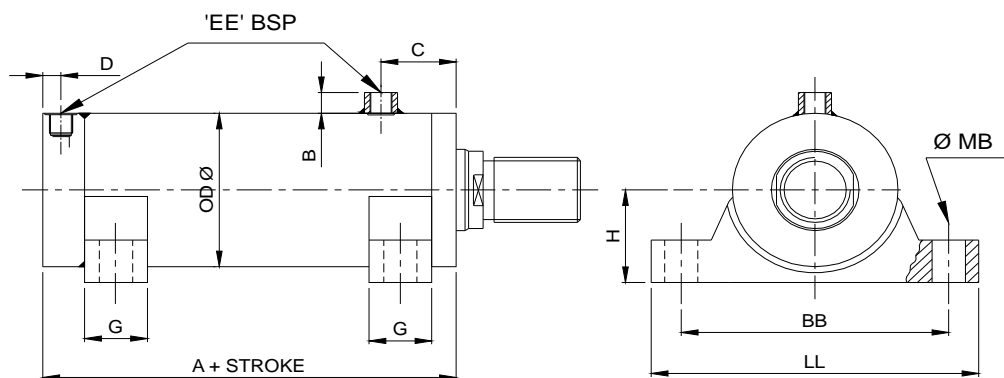
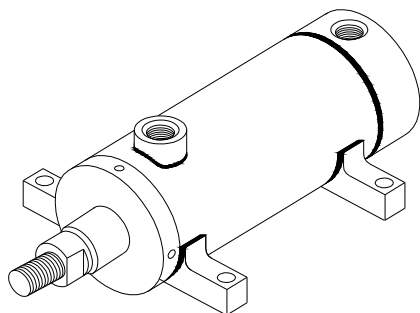
BOREØ	A	B	C	OD Ø	D	EE BSP	G	K	ØMB	R
40.0	135.0	18.0	57.0	50.0	16.0	1/2"	15.0	10.0	8.4	90.0
50.0	154.0	18.0	60.0	62.0	16.0	1/2"	18.0	11.0	10.5	100.0
63.0	167.8	18.0	68.0	76.0	16.0	1/2"	22.0	11.0	13.0	115.0
80.0	195.8	20.0	77.0	93.0	19.0	3/4"	25.0	13.0	13.0	150.0
100.0	212.8	20.0	81.0	114.0	19.0	3/4"	35.0	13.0	17.0	175.0
125.0	222.8	20.0	88.0	140.0	19.0	3/4"	40.0	15.0	22.0	210.0
160.0	259.8	22.0	103.0	179.0	23.5	1"	50.0	17.0	30.0	270.0

All dimensions are in millimetres unless otherwise stated.

Intermediate Trunnion Mounting  
HD I Model UM



Foot Lug Mounting  
HDI Model LE



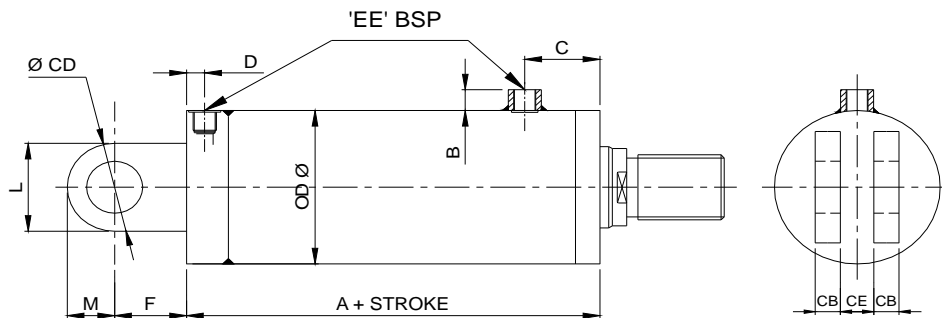
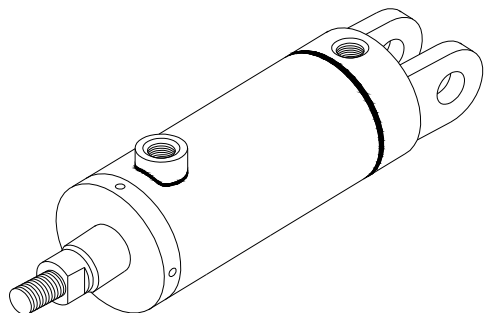
Dimensions - UM & LE

For Rod End Dimensions - see Page 4

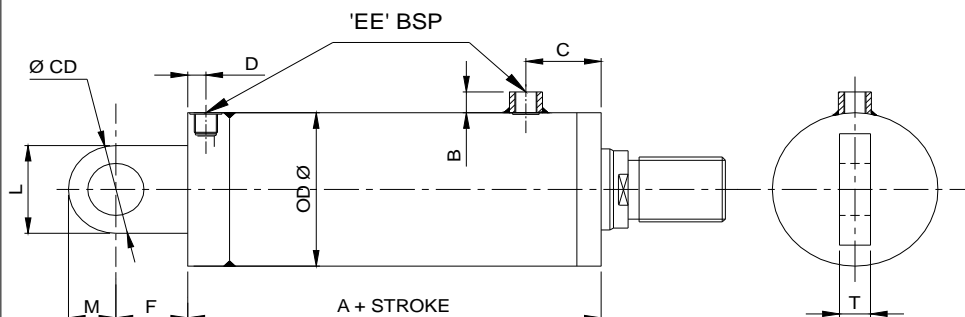
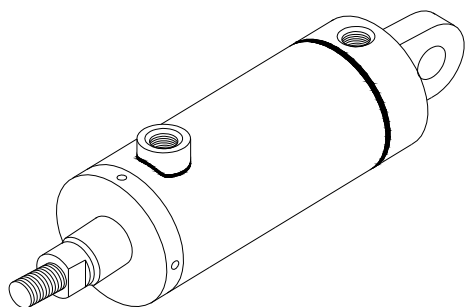
BOREØ	A	B	C	BB	D	EE BSP	G	H	L	Ø LD	LL	Ø LT	MB Ø	OD Ø	TA	TL	MIN XI
40.0	135.0	18.0	57.0	115.0	16.0	1/2"	22.0	35.0	32.0	16.0	90.0	25.0	9.0	50.0	68.0	12.0	97.0
50.0	154.0	18.0	60.0	130.0	16.0	1/2"	25.0	40.0	40.0	20.0	105.0	30.0	11.0	62.0	82.0	16.0	102.0
63.0	167.8	18.0	68.0	150.0	16.0	1/2"	30.0	48.0	50.0	25.0	120.0	35.0	14.0	76.0	98.0	20.0	113.0
80.0	195.8	20.0	77.0	195.0	19.0	3/4"	40.0	58.0	64.0	32.0	155.0	40.0	18.0	93.0	117.0	25.0	124.0
100.0	212.8	20.0	81.0	230.0	19.0	3/4"	50.0	70.0	80.0	40.0	185.0	50.0	22.0	114.0	140.0	32.0	132.0
125.0	222.8	20.0	88.0	270.0	19.0	3/4"	55.0	85.0	100.0	50.0	220.0	55.0	26.0	140.0	170.0	40.0	144.0
160.0	259.8	22.0	103.0	360.0	23.5	1"	70.0	108.0	140.0	70.0	290.0	70.0	30.0	179.0	225.0	50.0	172.0

All dimensions are in millimetres unless otherwise stated.

Female Clevis Mounting  
HDI Model CF



Male Clevis Mounting  
HDI Model CM



Dimensions - CM & CF For Rod End Dimensions - see Page 4

BOREØ	A	B	C	CB	ØCD	CE	D	EE BSP	F	L	M	OD Ø	T
40.0	135.0	18.0	57.0	12.0	16.0	21.5	16.0	1/2"	25.0	32.0	16.0	50.0	20.0
50.0	154.0	18.0	60.0	14.0	20.0	26.5	16.0	1/2"	32.0	40.0	20.0	62.0	25.0
63.0	167.8	18.0	68.0	18.0	25.0	33.5	16.0	1/2"	40.0	50.0	25.0	76.0	32.0
80.0	195.8	20.0	77.0	20.0	32.0	42.0	19.0	3/4"	50.0	64.0	32.0	93.0	40.0
100.0	212.8	20.0	81.0	25.0	40.0	52.0	19.0	3/4"	65.0	80.0	40.0	114.0	50.0
125.0	222.8	20.0	88.0	32.0	50.0	65.0	19.0	3/4"	80.0	100.0	50.0	140.0	63.0
160.0	259.8	22.0	103.0	50.0	70.0	84.0	23.5	1"	110.0	140.0	70.0	179.0	80.0

FOR SPERICAL ROLLER BEARING DESIGN PLEASE CONSULT WITH DESIGN

All dimensions are in millimetres unless otherwise stated.

## MODEL NUMBER

Each HDI Series WCG Cylinder is assigned a model number. Consisting of coded symbols, the model number can be used by customers, sales representatives & factory personnel as a complete & accurate description of the cylinder.

symbols that represents the cylinder features you wants, & put them down in sequence indicated by the example below. This example make use all of the 6 diff model number symbols group, although many model numbers will not require all, as in case where cushioning is not required, or where a double rod cylinder is not required, or where there are no special modifications, etc.

To develop a model number for a HDI cylinder, select those

Feature	Description	Page	Symbol	Example
				HDI CYL : 40.0 - * - DR - UM - WCG - 10 - R - C - 32 - S
Specification	Hydrodyne Industries cylinder	—	HDI CYL	↑
Bore	Specify in mm	—	—	↑
Cushioned-Head	non cushioned		*	↑
ROD	Use if double rod cylinder	4	DR	↑
Mounting Style	Front Flange	5	FF	↑
	Rear Flange	5	FR	
	Foot Lug	6	LE	
	Intermediate Trunnion	6	UM	
	Male Clevis	7	CM	
	Female Clevis	7	CF	
Series	Used in all WCG Model nos.		WCG	↑
Piston Rod No .	Number as shown	4		↑
	"Rod End Dimensions"		10	
	STD1: 10 STD2: 20		20	
Ports	BSP (parallel thread)		R	↑
Cushion - Cap	Used only if cushion required		C	↑
Stroke	Specify in mm		—	↑
special features	One or morwe of the following Air Bleeds Over Size Ports Rod End Bellows Special Seals Stop Tube Stroke Adjuster Tie Rod Supports ...or any other non-standard features		S	↑



SEAL KIT FOR HDI CYLINDERS

Key to Part Number

Seal kit for WCG series cylinders simplify the ordering & maintenance processes. When ordering the seal kits, please refer to the identification plate on the cylinder body & supply the following information

Seal kit HDI Cyl - Bore - Mounting - Type - Rod

For Example :

Seal kit HDI Cyl - 40.0 - CM - WCG - 10

Where, 38.1 = Cylinder Bore

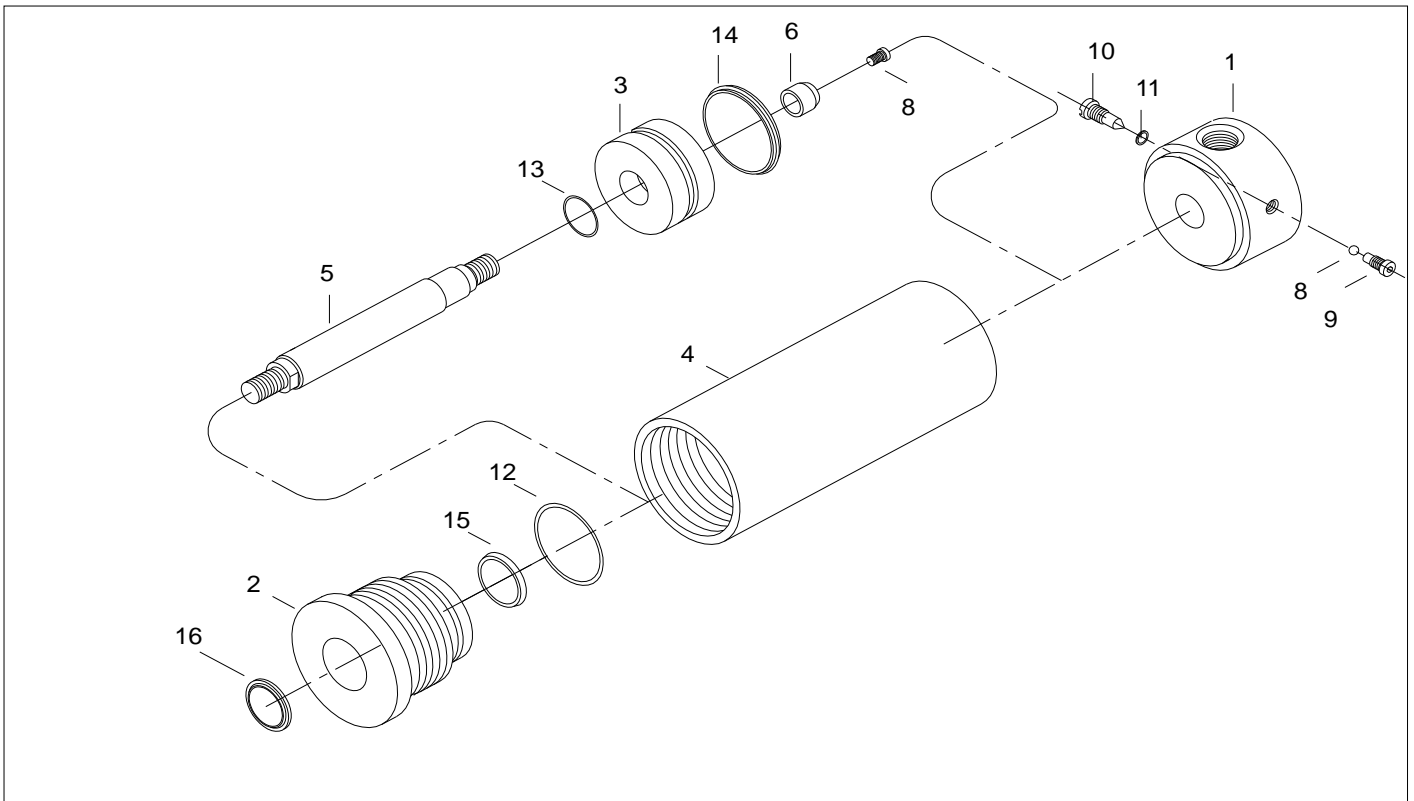
CM = Clevis Mounting

WCG = High Pressure Welded Cylinder

10 = STD1. Rod for 40.0 Bore

- 1) Cap End
- 2) Gland / Cartridge
- 3) Piston
- 4) Pipe
- 5) Piston Rod
- 6) Cap End Cushioning Spear
- 7) Locking Pin - Piston Rod
- 8) Ball - Cushion Check Valve
- 9) Check Valve
- 10) Needle Valve
- 11) Needle Valve 'O' Ring
- 12) Gland 'O' Ring
- 13) Piston / Rod 'O' Ring
- 14) Piston Seal
- 15) Gland 'U' Seal
- 16) Rod Wiper Seal

EXPLODED VIEW  
WCG SERIES CYLINDER



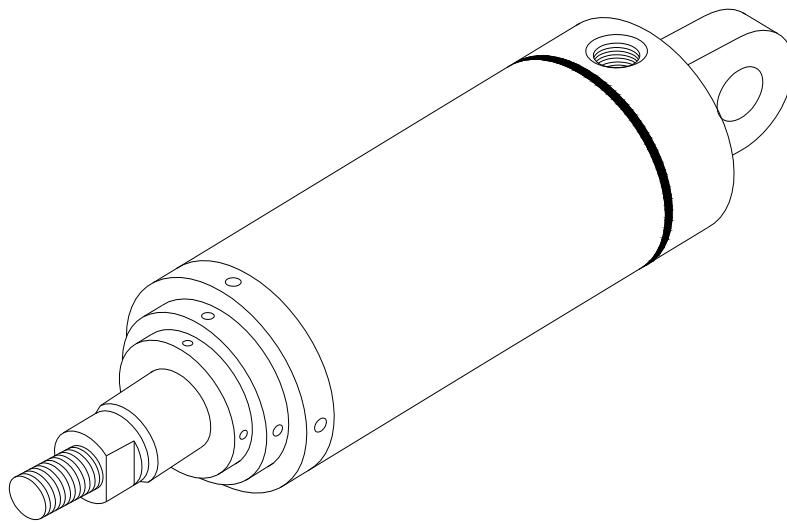
Repairs :

WCG Cylinders are designed to make onsite maintenance as repairs as easy as possible, some operation can only be carried out in our factory. For Repairing cylinder in our factory the replacement parts, which are necessary to return it to 'as good as new' condition. Should the condition of return cylinder be such that repairs would be uneconomical, you will be notified.

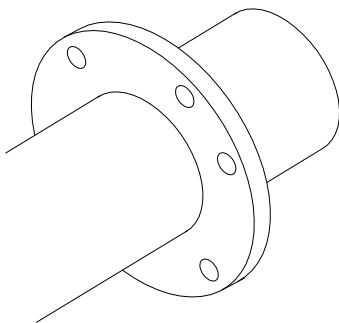
**WCG SERIES HIGH PRESSURE WELDED TYPE HYDRAULIC CYLINDER**

**SPECIFICATIONS**

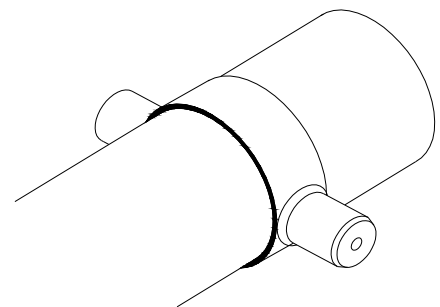
- |    |                         |     |   |
|----|-------------------------|-----|---|
| 1. | MAX. OPERATING PRESSURE | --- | 160 BAR (standard)  |
| 2. | TEMPRATURE              | --- | -20°C to +80°C with standard nitrile/polyurethane seals.<br>Higher temperature with viton/teflon seals. |
| 3. | MEDIUM                  | --- | Mineral oil<br>Cylinders to oprate with water based fluids available on request.                        |



**OPTIONAL BARREL MOUNT**



**FLANGE MOUNT**



**TRUNNION MOUNT**

**DESIGN FEATURES & MATERIALS**

**HYDRODYNE** series Telescopic cylinders are designed for mobile / industrial application with long strokes but small profiles. Advantages of telescopic have over conventional rod-type cylinder is their ability to provide an exceptionally long stroke from a compact initial package. The collapsed length of typical telescopic cylinders varies between 20% and 40% of their extended length. Thus, when mounting space is limited and the application needs a long stroke, a telescopic cylinder is a natural solution.

As the name implies, telescopic cylinders are constructed like a telescope. In practice, the maximum number of moving stages is five.

**HYDRODYNE INDUSTRIES** manufacture telescopic cylinder upto five stages in single acting & double acting.

**THE GLAND**

Gland Nut can be externally removed without disassembly of the cylinder. Its long bearing surface is inboard of the seal assuring positive lubrication from within the cylinder. Leak Proof cartridge gland seals consists of :

- Polyurethane / low friction nitrile seal completely self compensating and self relieving to withstand all pressure variations and mechanical deflections that may occur.
- Secondary seal - Hydro dyne wiper seal performs a double service by wiping clean any oil film adhering to the rod on the advance stroke, and cleaning the dirt off the rod on return stroke

A static 'o'ring seal is interperet with tube and to serve as a prevailing torque lock .

**THE PISTON**

The piston is of one piece construction manufactured from fine grain cast iron or steel ,dependent upon the piston seal requirements. The standard , piston seal is a double acting elastomeric seal with anti-extrusion rings .

The wide piston surface considerably reduces bearing loads and wear during mechanical deflection . long thread engagement with the with piston rod provides grater shock absorption ,and the piston is permanently locked with a pin .

**THE CAP END**

The cap end is manufactured from medium carbon steel and are welded to the the tube end.

**THE PISTON ROD**

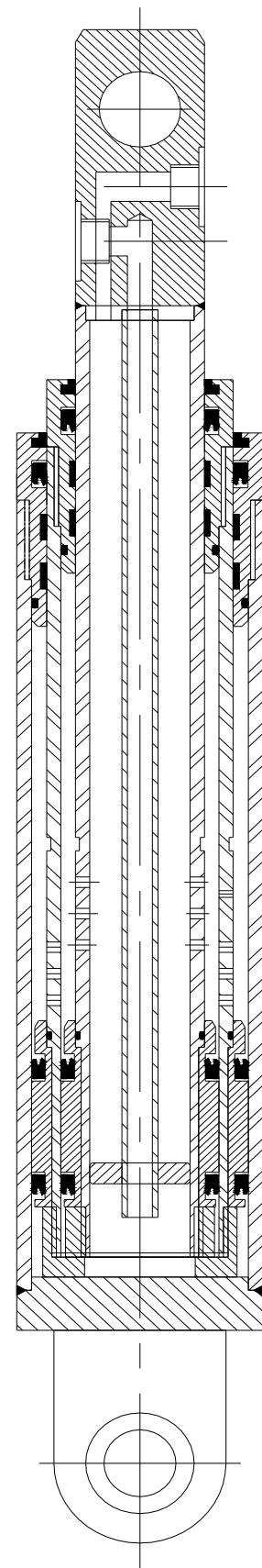
Piston rod are made from high tensile medium ,carbon steel ground and hard chrome plated to thickness of 20 to 25 microns and surface finish to 0.5um or better.

**THE CYLINDER BODY**

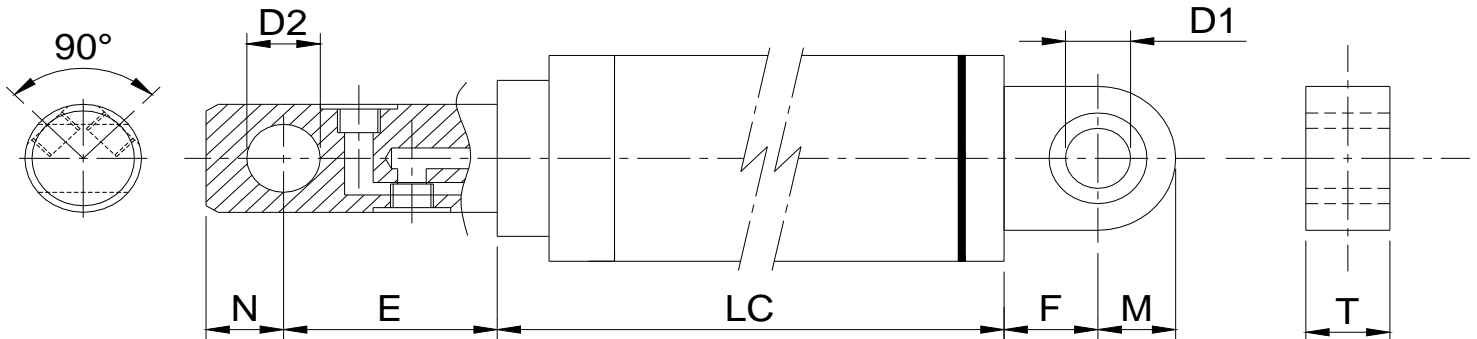
The cylinder is made from heavy wall steel tubing ,honed to a micro-finish bore . Normally, all major welding on the tube are done before the honing. The gland threads on the tube ID are machined after honing to ensure concentricity between the piston, rod, and the tube bore.

**THE SEALS**

All dynamic ,elastomeric seals used with series Telescopic cylinders are design to seal with minimum friction under varying pressure .This together with fine finishes on the cylinder bore and piston rod,provide long seal life .



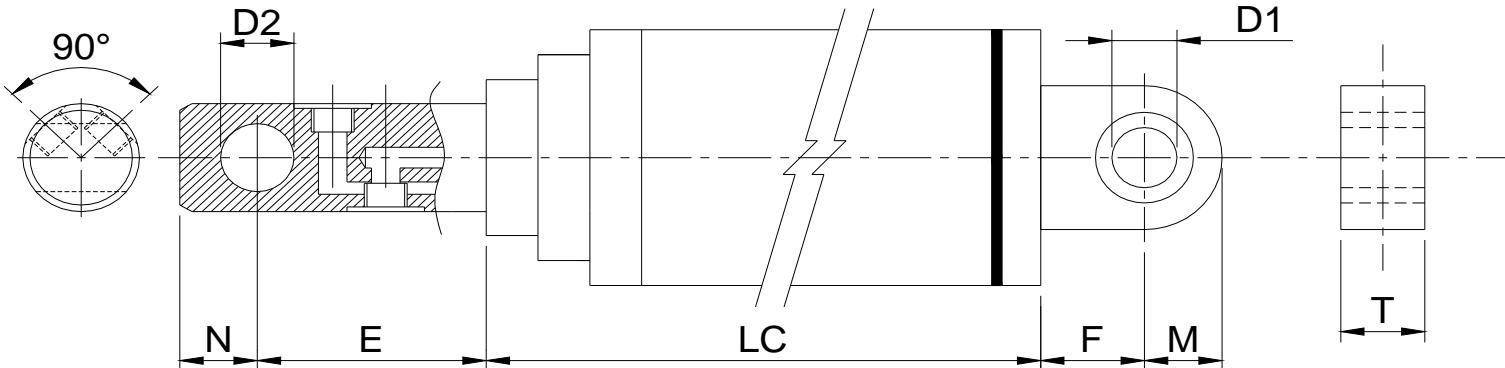
TWO STAGE DOUBLE ACTING CYLINDERS



MODEL NO. DESCRIPTION	26	25	24	23	22
Max OD	203.20	168.275	136.525	107.95	82.55
1st Bore	184.15	152.40	120.65	95.25	69.85
2nd Bore	152.40	120.65	95.25	69.85	44.45
Inner Rod Ø	136.52	107.95	82.55	57.15	31.75
E	95.25	90.47	90.47	90.47	76.2
F	110.0	80.0	65.0	50.0	40.0
M	70.0	50.0	40.0	32.0	25.0
N	70.0	50.0	40.0	32.0	25.0
Max Stroke	142"	117"	108"	100"	95"
X	14.5"	13.75"	13.5"	13.0"	13.0"
LC up to 66" stroke		$\frac{\text{Stroke}}{2} + X$			
Extension Port	1.25"	1" BSP	1" BSP	3/4" BSP	1/2" BSP
Retraction Port	1" BSP	3/4" BSP	3/4" BSP	1/2" BSP	3/8" BSP
Pin Ø D1	60.0	50.0	40.0	32.0	20.0
Pin Ø D2	60.0	50.0	40.0	32.0	20.0
T	60.0	50.0	40.0	32.0	25.0

All dimensions are in millimetres unless otherwise stated.

THREE STAGE DOUBLE ACTING CYLINDERS



MODEL NO. DESCRIPTION	36	35	34	33
Max OD	203.20	168.27	136.52	107.95
1st Bore	184.15	152.4	120.65	95.25
2nd Bore	152.4	120.65	95.25	69.65
3rd Bore	120.65	95.25	69.85	44.45
Inner Rod Ø	107.95	82.55	57.15	31.75
E	90.47	90.47	90.47	76.2
F	110.0	80.0	65.0	50.0
M	70.0	50.0	40.0	32.0
N	50.0	40.0	32.0	25.0
Max Stroke	175"	150"	146"	142"
X	14 3/4"	14 3/4"	14"	14"

LC up to 95" stroke

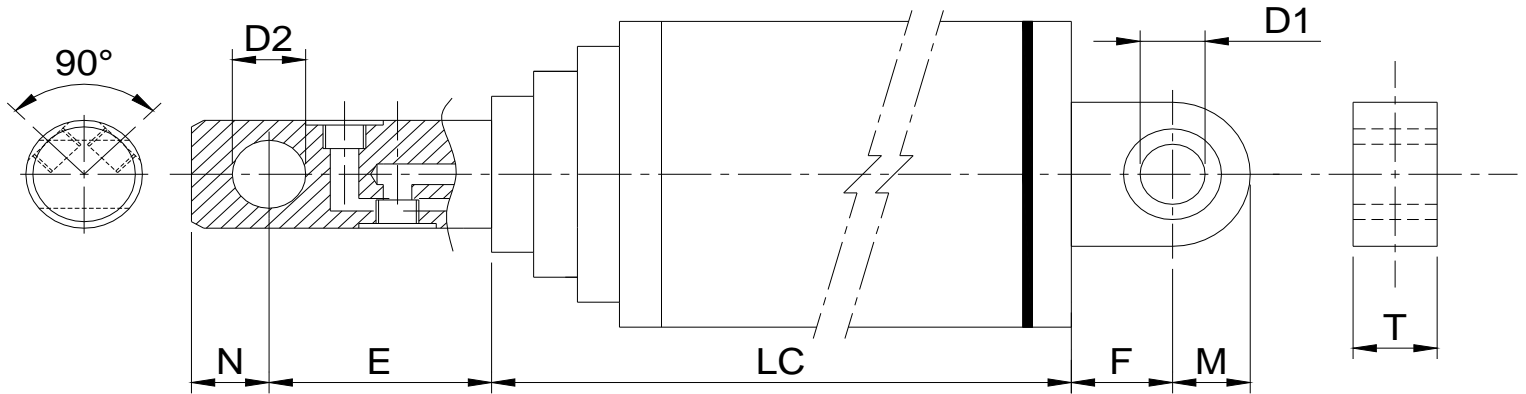
$$\frac{\text{Stroke}}{3} + X$$

Extension Port	1" BSP	1" BSP	3/4" BSP	1/2" BSP
Retraction Port	3/4" BSP	3/4" BSP	1/2" BSP	3/8" BSP
Pin Ø D1	60.0	50.0	40.0	32.0
Pin Ø D2	50.0	40.0	32.0	20.0
T	60.0	50.0	40.0	32.0

All dimensions are in millimetres unless otherwise stated.



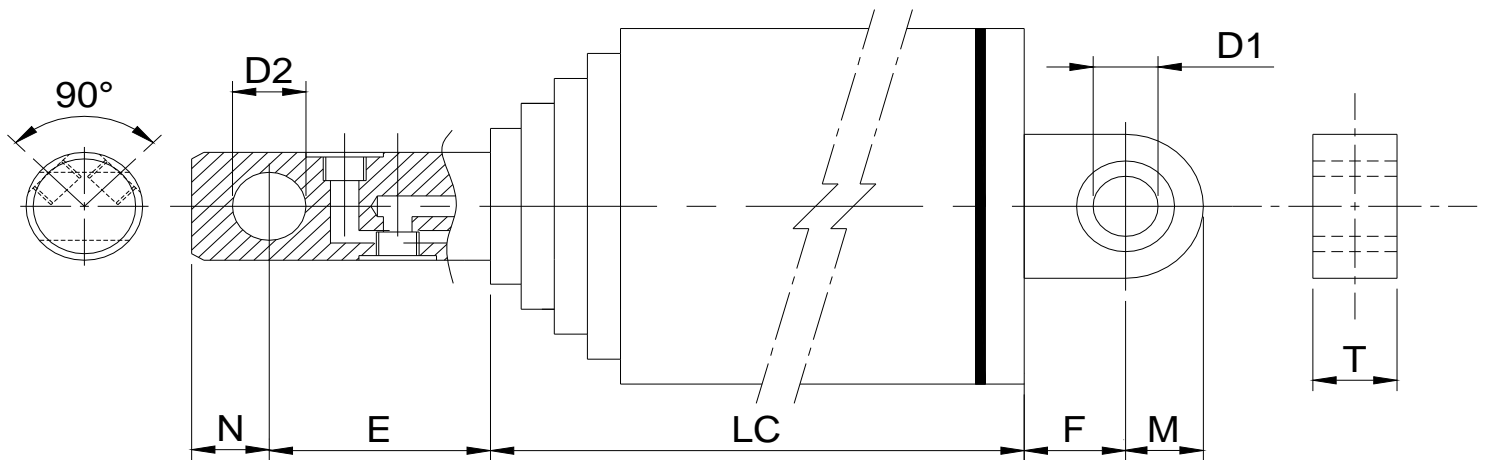
**FOUR STAGE DOUBLE ACTING CYLINDERS**



MODEL NO.		46	45	44
DESCRIPTION				
Max OD		203.20	168.27	136.52
1st Bore		184.15	152.4	120.65
2nd Bore		152.4	120.65	95.25
3rd Bore		120.65	95.25	69.85
4th Bore		95.25	69.85	44.45
Inner Rod Ø		82.55	57.15	31.75
E		90.5	90.5	90.5
F		110.0	80.0	65.0
M		70.0	50.0	40.0
N		40.0	32.0	25.0
Max Stroke		204"	191"	179"
X		15 3/4"	15 1/4"	15"
LC up to 126" stroke		$\frac{\text{Stroke}}{4} + X$		
Extension Port		1" BSP	3/4" BSP	1/2" BSP
Retraction Port		3/4" BSP	1/2" BSP	3/8" BSP
Pin Ø D1		60.0	50.0	40.0
Pin Ø D2		40.0	32.0	20.0
T		60.0	50.0	40.0

All dimensions are in millimetres unless otherwise stated.

**FIVE STAGE DOUBLE ACTING CYLINDERS**



MODEL NO. DESCRIPTION	57	56	55
Max OD	235.9	203.20	168.27
1st Bore	215.9	184.15	152.40
2nd Bore	184.15	152.4	120.65
3rd Bore	152.4	120.65	95.25
4th Bore	120.65	95.25	69.85
5th Bore	95.25	69.85	44.45
Inner Rod Ø	82.55	57.15	31.75
E	90.47	90.47	76.2
F	110.0	80.0	65.0
M	70.0	50.0	40.0
N	40.0	32.0	25.0
Max Stroke	204"	191"	179"
X	16.3/4"	16.1/4"	16"
LC up to 157" stroke	$\frac{\text{Stroke}}{5} + X$		
Extension Port	1" BSP	3/4" BSP	1/2" BSP
Retraction Port	3/4" BSP	1/2" BSP	3/8" BSP
Pin Ø D1	70.0	60.0	50.0
Pin Ø D2	40.0	32.0	20.0
T	70.0	60.0	50.0

All dimensions are in millimetres unless otherwise stated.



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