

FULL FEATURE ISO/VDMA CYLINDERS PROVIDING EXCEPTIONAL PERFORMANCE



Series CVA 32-100 mm Bores

ports, cushion controls, and port controls are available in any combination on any side of head (extend end) and cap (retract end) See the Hushcontrol Advantage on the next page.

rugged and lightweight anodized aluminum alloy heads, caps, and tube

CVA and CVB cylinders feature urethane piston and rod seals for long life. CVC Cylinders feature urethane rod seal and long life nitrile piston seal

enhanced

PTFE wear ring (CVA, CVB) provides piston support and enhances durability. Design 2 [6] increases the width for superior support (sizes 25-50)

enhanced

increased piston seal retention for higher speed applications

cylinders, including port and cushion controls, are easily field repairable, maximizing your investment

effective cushion up to 1.19 in [30.2 mm] for smooth deceleration at end of stroke

built-in shock pads are standard on all sizes, absorbing impact energy and eliminating metal to metal contact

imperial design available with imperial ports, stroke length, and rod for easy integration (mounting is metric)

PHD'S PORT CONTROL® is a built-in flow control valve for regulating speed of cylinder through its entire stroke

integrated standard female threads and a variety of mounting accessories provide ease of integration

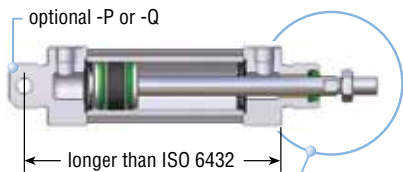
rod seal retention ring for extreme applications

standard alloy steel and optional corrosion resistant stainless steel piston rods are hard chrome plated for maximum life and durability

enhanced

now retained for extreme applications

internally lubricated engineered polymer bearing for long service life

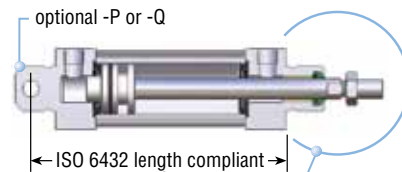


optional -P or -Q

longer than ISO 6432

STANDARD MOUNTING is 6432 compliant

CVB



optional -P or -Q

ISO 6432 length compliant with -P or -Q mounting

STANDARD MOUNTING is 6432 compliant

CVC

- Available in 20 & 25 mm bores
- Same construction as CVA
- ISO 6432 compliant rod and mountings (metric unit)
- Longer strokes and lower breakaway than CVC
- Distance between mountings is longer than ISO 6432 specifications (metric unit)

- Available in 20 & 25 mm bores
- Same construction as CVA and CVB, uses compression piston seal
- ISO 6432 compliant rod and mountings (metric unit)
- ISO 6432 compliant length between mountings (metric unit)
- Shorter length than CVB

Major Benefits

- ISO/VDMA interchange for easy mounting (metric unit).
- Imperial unit provides simplified integration in imperial facilities.
- PTFE wear ring and built-in shock pads for long cylinder life.
- Rodlok option for easy and dependable locking of piston rod
- Optional built-in port controls and cushions for superior speed and deceleration control.

Industry Uses

- Automotive
- Material handling/conveyors
- Assembly machines
- General industrial automation

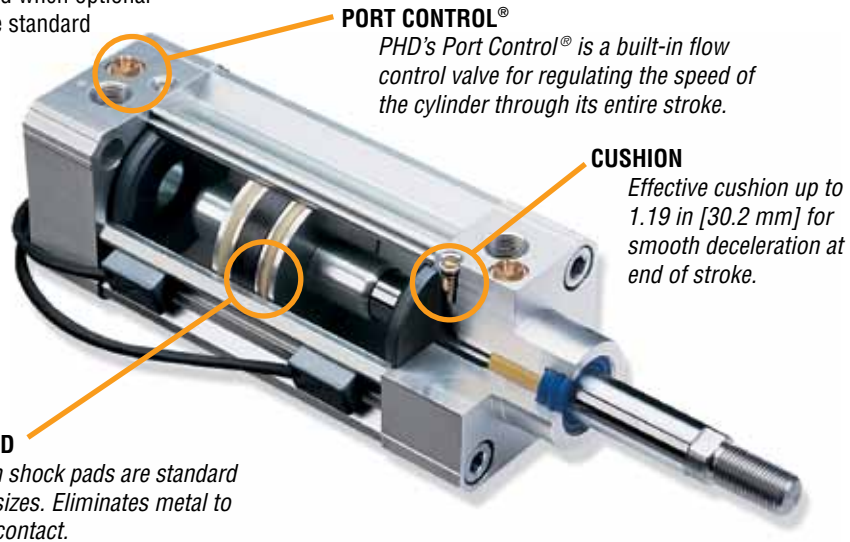
BENEFITS: SERIES CV CYLINDERS

The cylinder features...

The HUSHCONTROL Advantage (-PB, -DB)

Only PHD Series CV Cylinders are offered with the Hushcontrol Advantage. Hushcontrol® is achieved when optional cushions and Port Controls® are ordered with the standard shock pads. This combination provides:

- Superior speed and deceleration control of piston rod and attached loads.
- Significantly lowers noise levels even at high cycle speeds.



PORT CONTROL®

PHD's Port Control® is a built-in flow control valve for regulating the speed of the cylinder through its entire stroke.

CUSHION

Effective cushion up to 1.19 in [30.2 mm] for smooth deceleration at end of stroke.

SHOCK PAD

Built-in shock pads are standard on all sizes. Eliminates metal to metal contact.

Optional Rodlok

- Optional Rodlok securely holds a static piston rod in place at any point of stroke desired. Ideal for applications where rod drift is unacceptable due to system leakage, line rupture, or power loss.
- Options -H46 = Rodlok ready cylinder (CVxS only)
-H47 = Rodlok unit includes locking device adaptor and cylinder preassembled (CVxS only) (See ordering data on page 1-32)



Rodlok

Kits and dimensions can be found on pages 1-37 and 1-38.

PRODUCT SELECTION GUIDE: SERIES CV CYLINDERS

SERIES CVC CYLINDERS 20 & 25 mm ISO 6432



- Available in bore sizes 20 mm and 25 mm. Conforms to ISO 6432 customer interface and overall unit length when specified with optional -P or -Q mounting. (metric units)

CV

SERIES CVB CYLINDERS 20 & 25 mm



- Available in bore sizes 20 mm and 25 mm. Customer interface conforms to ISO 6432 for rod and mounting. (metric units)

SERIES CVA CYLINDERS 32-100 mm ISO 6431



- Standard 32 mm through 100 mm bore units conform to ISO 6431 and VDMA 24562 specifications.

SERIES CVA OR CVB 3 position CYLINDERS



- Series CVA and CVB are available as 3 position units.

SERIES CVA OR CVB DOUBLE ROD END CYLINDERS

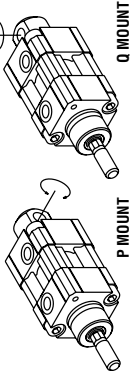


- Series CVA and CVB are available as double rod end units.

ORDERING DATA: SERIES CV CYLINDERS

CV

REAR PIVOT MOUNTING STYLES (20 and 25 mm BORES ONLY)



TO ORDER, SPECIFY:

Product, Series, Type, Design No., Mounting style, Bore size, Stroke, and any Options.

TYPE
S - Single Rod, double acting (Standard)
D - Double Rod, double acting (Not available on 3 position units.)

THREE POSITION UNIT
(Specify only if needed) (Not available on Series CVC)
See note 7.

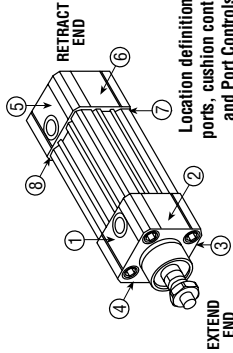
MOUNTING STYLE
P - Rear pivot in position 5
Q - Rear pivot in position 6
V - Standard mounting
4 female threads each end per ISO 6431/VDMA 24562 & ISO 6432*
(-P and -Q available on 20 & 25 mm bores only)

STROKE LENGTHS (15 mm (5/8") = minimum stroke in 1 mm (1/8") increments)	
BORE [mm]	METRIC MAXIMUM STROKE mm
CVC20	500
CVC25	500
CVB20	750
CVB25	750
32	1000
40	1000
50	1000
63	1000
80	1000
100	1000

IMPERIAL MAXIMUM STROKE in

Contact PHD for shorter or longer strokes.

OPTIONAL PORT LOCATION
UB00 - Ports on all sides, both ends (Not available with Port Controls on same end) Contact PHD For other combinations. Standard port locations are 1 & 5. See note 7.



Location definition for ports, cushion controls, and Port Controls®

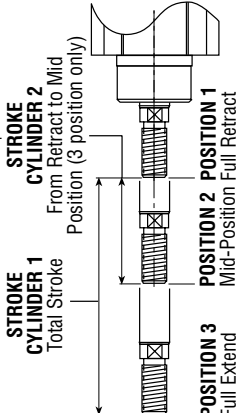
CUSHION CONTROL
DB - Cushion Controls Both Ends
DE - Cushion Control Extend Only
DR - Cushion Control Retract Only
Standard cushion control locations are 1 & 5. See note 7.

M-Z1

SERIES SIZES 20 & 25 mm ONLY
VB - ISO 6432 150 psi [10 bar] Air See note 8.
VC - ISO 6432 150 psi [10 bar] Air See note 9.

DESIGN NO.
2 - Imperial
(See note 5.)
6 - Metric

BORE in	BORE mm	PISTON AREA sq in	PISTON AREA sq mm
20	.787	314	.486
25	.984	491	.760
32	1.26	804	1.25
40	1.58	1257	1.95
50	1.97	1963	3.05
63	2.48	3117	4.83
80	3.15	5027	7.79
100	3.94	7854	12.17



NOTES:

- Z1 option may have reduced cylinder performance due to chrome-plated stainless steel rod in place of chrome-plated alloy steel.
- H46 & -H47 is not available in -Z1.
- *For mounting accessories and dimensions, see Accessories Section.
- ⊕ Marked options provide additional cylinder flexibility, but do not dimensionally comply with the ISO 6431/VDMA 24562 or ISO 6432 specifications.
- Imperial unit provides imperial ports, rod ends, and stroke. Mountings are metric.
- For switch information, see switch option page and Switches Section.
- On 3 position units, ports, options -DB and/or -PB are available in locations 1 and 5 only. Contact PHD for other configurations. See option pages.
- Customer interface conforms to ISO 6432, but longer length than ISO 6432.
- Customer interface and lengths conform to ISO 6432 with optional -P or -Q mounting specified on CVC only.

DB - UB00 - M-Z1

PORT CONTROL® BUILT-IN METER OUT FLOW CONTROL VALVE
PB - Port Controls Both Ends
PE - Port Control Extend Only
PR - Port Control Retract Only
Standard port control locations are 1 & 5. See note 7.

CYLINDER OPTIONS
F22 - 4 Wrench Flats on Rod
F44 - No Wrench Flats on Rod
H46 - Rodlok ready cylinder (CVxS only) See Note 2.
H47 - Rodlok unit includes locking device (CVxS only) See Note 2.
K_ - Extra Rod Extension in 5 mm (5/8") increments. Length code is K5 = 5 mm (5/8"), K15 = 15 mm (1-7/8"), etc.
L7 - G Port (BSPP) on imperial units
L9 - NPT Ports on metric units
M - Magnetic piston for use with PHD Miniature Reed and Solid State Switches
T44 - Female Rod End Undersized Thread
T55 - Plain Rod End
TEE - Male Rod with Oversized Thread (CVAx only)
Z1 - Corrosion Resistant, chrome-plated Stainless Steel Rod, and appropriate coating on ferrous parts.

Options may affect unit length. See unit dimension and options pages for adders.

ENGINEERING DATA: SERIES CV CYLINDERS

SPECIFICATIONS	SERIES CVA, CVB	SERIES CVC
OPERATING PRESSURE SINGLE ROD DOUBLE ROD	7.5 to 150 psi [0.5 bar to 10 bar]	10 to 150 psi [0.67 bar to 10 bar]
TEMPERATURE LIMITS	-20° to +180°F [-28° to +82°C]	
VELOCITY	20 in/sec [.5 m/sec] typical min, zero load at 100 psi [7 bar]	
LIFE EXPECTANCY	130 million linear inches [3.3 million linear meters] min	100 million linear inches [2.5 million linear meters] minimum
LUBRICATION	Factory lubricated for rated life	
MAINTENANCE	Field repairable	

CV

BORE mm	NOMINAL STROKE (L)		NOMINAL STROKE CYL. 1 FULL STROKE TOLERANCE*		NOMINAL STROKE 3 POSITION STROKE TOLERANCE*	
	in	mm	in	mm	in	mm
20 & 25	L ≤ 4	L ≤ 100	+ 0.059/-0	+ 1.5/-0	+ 0.059/-0.046	+ 1.5/-1.2
	L > 4	L > 100	+ 0.079/-0	+ 2.0/-0	+ 0.079/-0.046	+ 2.0/-1.2
32, 40, & 50	L ≤ 20	L ≤ 500	+ 0.079/-0	+ 2.0/-0	+ 0.079/-0.050	+ 2.0/-1.3
	L > 20	L > 500	+ 0.126/-0	+ 3.2/-0	+ 0.126/-0.050	+ 3.2/-1.3
63, 80, & 100	L ≤ 20	L ≤ 500	+ 0.098/-0	+ 2.5/-0	+ 0.098/-0.070	+ 2.5/-1.8
	L > 20	L > 500	+ 0.157/-0	+ 4.0/-0	+ 0.157/-0.070	+ 4.0/-1.8

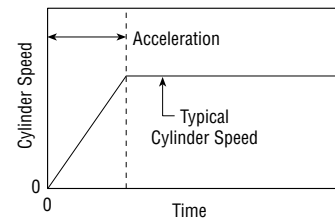
NOTE: *Stroke tolerances/values measured at 60 ± 4 psi [4 ± .27 bar] due to impact seal design.

BORE DIA in mm	ROD DIA in mm	ROD DIRECTION	EFFECTIVE AREA		CYLINDER WEIGHTS				TYPICAL CYLINDER SPEED**			
			in ²	mm ²	BASE WEIGHT lb kg	ADDER PER 1" [25 mm]		STD & CUSHION UNITS in/sec m/sec		PORT CONTROL UNITS in/sec m/sec		
0.787	20	EXTEND RETRACT	0.49 0.41	314 264	0.55	0.25	0.1	0.04	200	5.08	35	0.89
0.984	25	EXTEND RETRACT	0.76 0.64	491 412	0.69	0.31	0.12	0.05	150	3.81	24	0.61
1.260	32	EXTEND RETRACT	1.25 1.07	804 691	1.45	0.66	0.17	0.08	105	2.67	33	0.84
1.575	40	EXTEND RETRACT	1.95 1.64	1257 1056	2.08	0.94	0.23	0.10	80	2.03	36	0.91
1.969	50	EXTEND RETRACT	3.04 2.56	1964 1649	3.28	1.49	0.32	0.15	80	2.03	21	0.53
2.480	63	EXTEND RETRACT	4.83 4.34	3117 2803	4.87	2.21	0.36	0.16	35	0.89	25	0.64
3.150	80	EXTEND RETRACT	7.79 7.03	5027 4536	7.78	3.53	0.52	0.24	25	0.64	18	0.46
3.937	100	EXTEND RETRACT	12.17 11.41	7854 7363	11.03	5.00	0.6	0.27	25	0.64	20	0.51

NOTE: **See diagram 1. The above speed data is based on:

- A) No attached load with a line pressure of 80 psi [5.5 bar] with a valve rated at Cv = 9.0.
- B) 20 mm and 25 mm cylinders tested with 0.17" ID tubing.
- C) 32 mm and 40 mm cylinders tested with 0.28" ID tubing.
- D) 50 mm, 63 mm, and 80 mm cylinders tested with 0.38" ID tubing.
- E) 100 mm cylinders tested with two 0.38" ID tubes to each port from the valve.
- F) Use the retract figures for calculating double rod end cylinder forces in both directions.

DIAGRAM 1
IDEALIZED CYLINDER SPEED



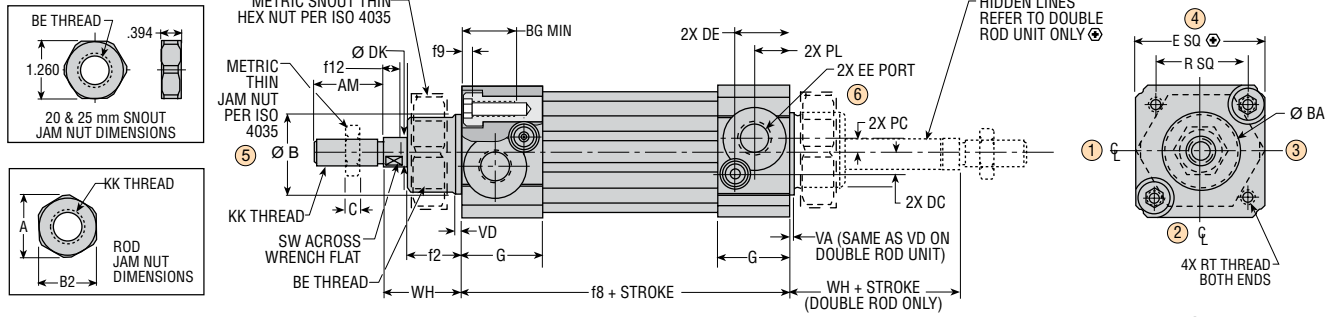
CYLINDER FORCE CALCULATIONS

	IMPERIAL	METRIC
	$F = P \times A$	$F = 0.1 \times P \times A$
F = Cylinder Force	lbs	N
P = Operating Pressure	psi	bar
A = Effective Area	in ²	mm ²
(Extend or Retract)		

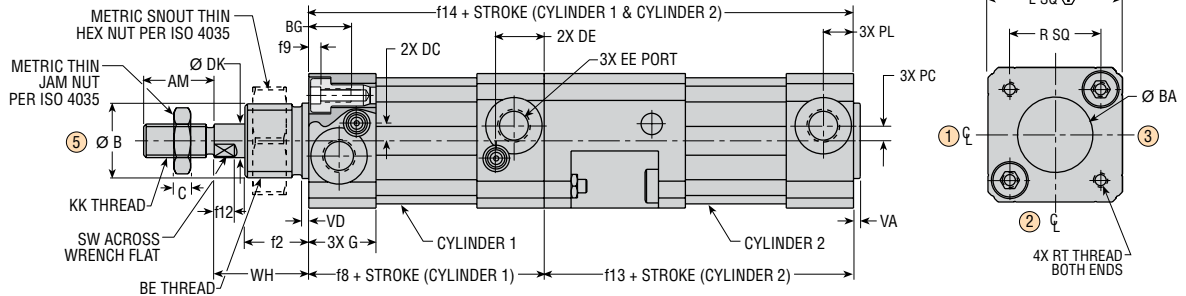
SIZING AND APPLICATION ASSISTANCE
See PHD Product Sizing Catalog for specific and complete sizing information.
Online sizing assistance is available at:
www.phdinc.com/apps/sizing

DIMENSIONS: SERIES CV CYLINDERS

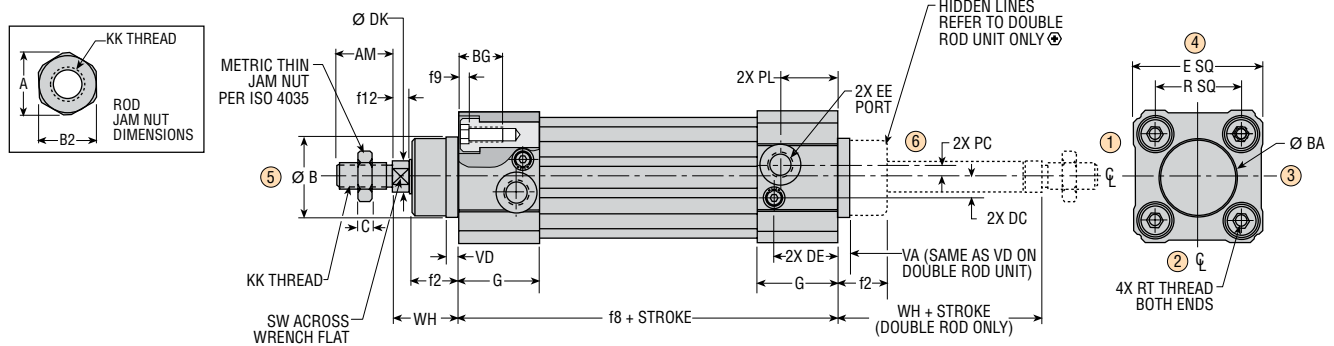
SIZES 20 & 25 mm



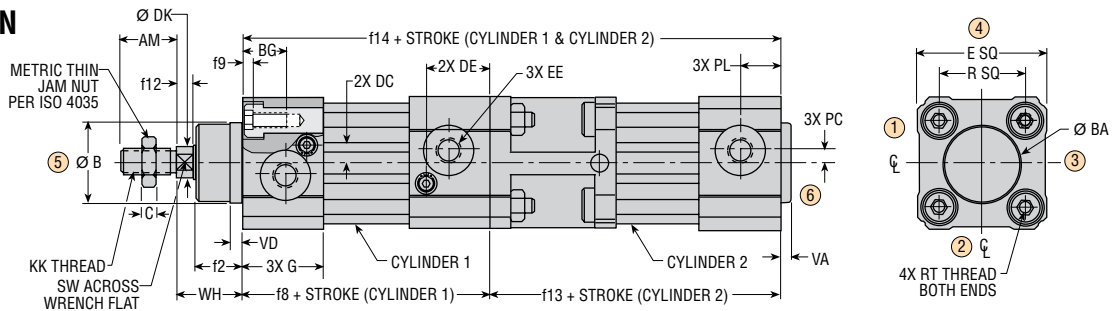
3 POSITION (CVB ONLY)



SIZES 32-100 mm



3 POSITION



Port Position: Indicated by circled numbers

DIMENSIONS: SERIES CV CYLINDERS

LETTER DIM	BORE SIZE															
	20 mm		25 mm		32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
A	.577	14.4	.650	18.9	.650	18.9	.866	21.1	1.083	26.8	1.083	26.75	1.299	33.0	1.299	33.0
AM	.748	19.0	.827	21.0	.827	21.0	.906	23.0	1.220	31.0	1.220	31.0	1.535	39.0	1.535	39.0
Ø B	.866	22.0	.866	22.0	1.181	30.0	1.378	35.0	1.575	40.0	1.772	45.0	1.772	45.0	2.165	55.0
B2	.500	13.0	.562	17.0	.562	17.0	.750	19.0	.938	24.0	.938	24.0	1.125	30.0	1.125	30.0
BA	.866	22.0	.866	22.0	1.181	30.0	1.378	35.0	1.575	40.0	1.772	45.0	1.772	45.0	2.165	55.0
BE	M22 x 1.5		M22 x 1.5													
BG min	.472	12.0	.472	12.0	.709	18.0	.709	18.0	.787	20.0	.787	20.0	.787	20.0	.787	20.0
C	.195	4.0	.210	5.0	.210	5.0	.323	6.0	.387	8.0	.387	8.0	.446	10.0	.446	10.0
DC***	.190	4.8	.226	5.7	.276	7.0	.374	9.5	.394	10.0	.354	9.0	.591	15.0	.630	16.0
DE***	.581	14.8	.559	14.2	.965	24.5	1.083	27.5	1.043	26.5	1.201	30.5	1.181	30.0	1.339	34.0
DK	.315	8.0	.394	10.0	.472	12.0	.630	16.0	.787	20.0	.787	20.0	.984	25.0	.984	25.0
E	1.457	37.0	1.575	40.0	1.949	49.5	2.205	56.0	2.697	68.5	3.150	80.0	3.858	98.0	4.528	115.0
EE PORT**	1/8 NPT	G 1/8	1/8 NPT	G 1/8	1/8 NPT	G 1/8	1/4 NPT	G 1/4	1/4 NPT	G 1/4	3/8 NPT	G 3/8	3/8 NPT	G 3/8	1/2 NPT	G 1/2
EE G. PORT DEPTH	—	8.0	—	8.0	—	8.0	—	9.0	—	9.0	—	12.0	—	12.0	—	14.0
f2	.669	17.0	.748	19.0	.728	18.5	.807	20.5	1.083	27.5	1.083	27.5	1.319	33.5	1.437	36.5
f8 CVA	—	—	—	—	3.701	94.0	4.134	105.0	4.173	106.0	4.764	121.0	5.039	128.0	—	—
f8 CVB	2.638	67.0	2.756	70.0	—	—	—	—	—	—	—	—	—	—	—	—
f8 CVC	2.323	59.0	2.520	64.0	—	—	—	—	—	—	—	—	—	—	—	—
f9	.142	3.6	.142	3.6	.165	4.2	.169	4.3	.224	5.7	.224	5.7	.268	6.8	.268	6.8
f12	.196	5.0	.236	6.0	.236	6.0	.256	6.5	.315	8.0	.315	8.0	.394	10.0	.394	10.0
f13	3.504	89.0	3.622	92.0	4.370	111.0	4.823	122.5	5.728	145.5	6.181	157.0	6.772	172.0	7.008	178.0
f14	6.142	156.0	6.378	162.0	8.071	205.0	8.957	227.5	9.902	251.5	10.945	278.0	11.811	300.0	12.441	316.0
G	.787	20.0	.787	20.0	1.220	31.0	1.358	34.5	1.358	34.5	1.496	38.0	1.496	38.0	1.654	42.0
KK	5/16-24	M8 x 1.25	3/8-24	M10 x 1.25	3/8-24	M10 x 1.25	1/2-20	M12 x 1.25	5/8-18	M16 x 1.5	5/8-18	M16 x 1.5	3/4-16	M20 x 1.5	3/4-16	M20 x 1.5
PC***	.167	4.2	.177	4.5	.197	5.0	.236	6.0	.236	6.0	.394	10.0	.394	10.0	.472	12.0
PL***	.354	9.0	.354	9.0	.630	16.0	.728	18.5	.728	18.5	.787	20.0	.709	18.0	.866	22.0
R	1.024	26.0	1.063	27.0	1.280	32.5	1.496	38.0	1.831	46.5	2.224	56.5	2.835	72.0	3.504	89.0
RT	M4 x 0.7		M4 x 0.7		M6 x 1		M6 x 1		M8 x 1.25		M8 x 1.25		M10 x 1.5		M10 x 1.5	
SW	.276	7.0	.315	8.0	.394	10.0	.512	13.0	.630	16.0	.630	16.0	.827	21.0	.827	21.0
VA	.079	2.0	.079	2.0	.157	4.0	.157	4.0	.157	4.0	.157	4.0	.157	4.0	.157	4.0
VD	.079	2.0	.079	2.0	.177	4.5	.177	4.5	.177	4.5	.177	4.5	.177	4.5	.177	4.5
WH*	.945	24.0	1.102	28.0	1.024	26.0	1.181	30.0	1.457	37.0	1.457	37.0	1.811	46.0	2.008	51.0

- NOTES:**
- 1) Unless otherwise dimensioned, mounting hole patterns are centered on the cylinder.
 - 2) Ports and cushions may appear on either side of the cylinder centerline based on option combinations.
 - 3) ** All metric (CVxx6) units, except port with Port Control® on same side, comply with ISO 16030 and DIN 3852 part 2 port specifications for short stud and large sealing surface. See Port Control® option sheet for port and Port Control® dimensions on units with ports and Port Controls® on the same side.
 - 4) *WH values are determined with cylinder at 60 ± 4 psi [4 ± .27 bar] due to impact seal design.
 - 5) ***⊗ Marked dimensions on the previous page provide additional flexibility, but do not dimensionally comply with ISO 6431/VDMA 24562 or ISO 6432 specifications.



OPTIONS: SERIES CV CYLINDERS

CV

DB CUSHION CONTROL IN BOTH DIRECTIONS

(standard location 1 & 5, see note)

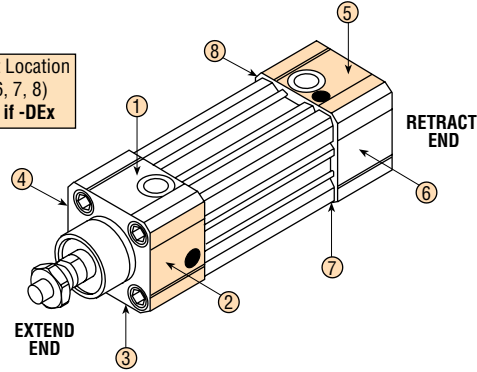
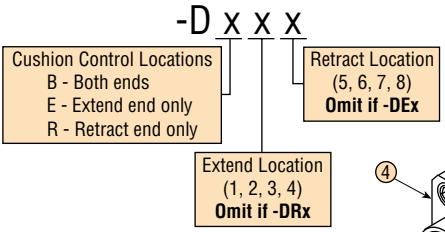
DE CUSHION CONTROL ON EXTEND ONLY

(standard location 1, not available on 3 position units)

DR CUSHION CONTROL ON RETRACT ONLY

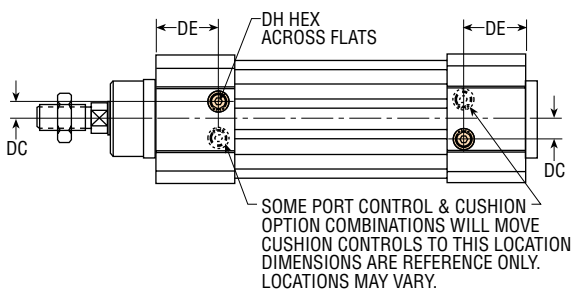
(standard location 5, not available on 3 position units)

CUSHION CONTROL OPTIONS

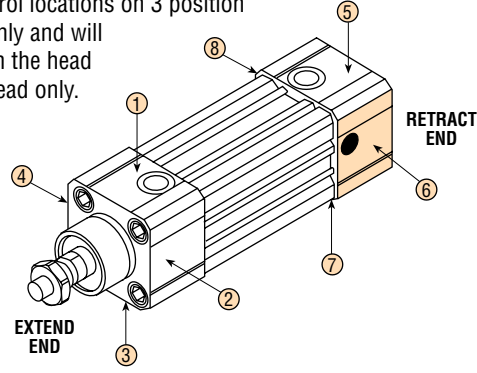


PHD cushions are designed for smooth deceleration at the end of stroke. When the cushion is activated, the remaining volume in the cylinder must exhaust past an adjustable needle which controls the amount of deceleration. The effective cushion lengths for each bore size are shown in the table below. To specify different cushion control locations on the head or cap, see option code above.

Note: Cushion controls on 3 position units are available only with -DB option in locations 1 and 5 only. 3 position units will have cushion on full extend and full retract.



Unit shown is -DB25, cushion in location 2 on extend end and cushion in location 5 on retract end. (Ports are shown in standard locations 1 & 5.) Cushion control locations on 3 position units are 1 and 5 only and will receive a control on the head and intermediate head only.

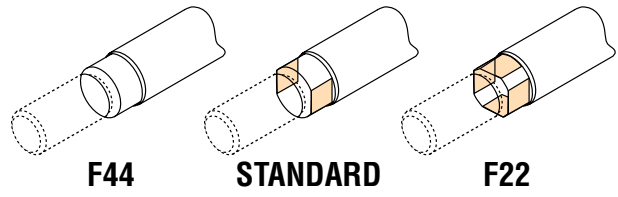


Unit shown is -DR6, cushion in location 6 on retract end and none on extend end. (Ports are shown in standard locations 1 & 5.)

LETTER DIM	BORE SIZE															
	20 mm		25 mm		32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
DC	.190	4.8	.226	5.7	.276	7.0	.374	9.5	.394	10.0	.354	9.0	.591	15.0	.630	16.0
DE	.581	14.8	.561	14.2	.965	24.5	1.083	27.5	1.043	26.5	1.201	30.5	1.181	30.0	1.339	34.0
DH	—	2.5	.561	2.5	—	2.5	—	2.5	—	2.5	—	2.5	—	3.0	—	3.0
EFFECTIVE CUSHION LENGTH	.441	11.2	.469	11.9	.598	15.2	.807	20.5	.870	22.1	.870	20.4	.894	22.7	1.189	30.2

F22 4 WRENCH FLATS ON ROD END ⊕

With this option, the rod is supplied with four rod end flats instead of the standard two flats. If this option is specified on double rod units, both rod ends will be supplied with four wrench flats.

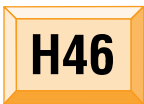


F44 NO WRENCH FLATS ON ROD END ⊕

This option omits rod end wrench flats. If this option is specified on double rod units, both rod ends will be supplied without wrench flats.

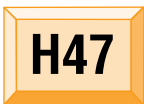
⊕ For metric units (CVxx6). This option does not dimensionally comply with the ISO 6431/VDMA 24562 or ISO 6432 specifications.

OPTIONS: SERIES CV CYLINDERS



RODLOK READY CYLINDER

Available on single rod units only.
(Rodlok sold separately) ⊕



RODLOK CYLINDER & RODLOK

Available on single rod units only.
(preassembled) ⊕

PHD's Rodlok is ideal for locking the piston rod while in a static/stationary position. When the pressure is removed from the port of the Rodlok, the mechanism will grip the rod and prevent it from moving. The loads are held indefinitely without power. Rodlok performance is application and environment sensitive (cleanliness of rod or Rodlok will also affect performance). THE RODLOK IS NOT DESIGNED TO BE USED AS A PERSONNEL SAFETY DEVICE.

Option -H46 provides a Rodlok ready cylinder with appropriate rod extension and materials for use with PHD's Rodlok.

Option -H47 provides a cylinder and Rodlok pre-assembled. The port for the Rodlok will be assembled in the same position as the port on the extend end of the cylinder.

The Rodlok locking device and adaptor can be purchased separately as kits. See chart at right. The locking device and adaptor are **not available with the -Z1 corrosion resistant finish**.

Dimensions continued on next page.

BORE mm	STATIC LOCKING FORCE*	
	lb	N
20	79	350
25	90	400
32	135	600
40	225	1000
50	337	1500
63	495	2200
80	674	3000
100	1124	5000

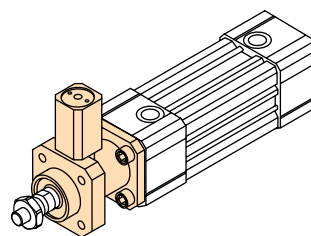
NOTE: *Locking force given in table is the actual locking force with a dry, clean rod and does not include any safety factor.

OPERATING PRESSURE

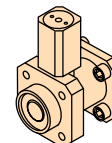
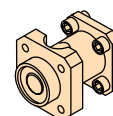
The operating pressure for the locking device is different than the operating pressure for the cylinder with the Rodlok attached. The locking device of the Rodlok is designed with an operating pressure range of 60 psi minimum to 150 psi maximum [4 to 10 bar]. The Series CV Cylinder with a Rodlok attached has an operating pressure range of 22 psi minimum to 150 psi maximum [1.5 to 10 bar].

⊕ For metric units (CVxx6).

This option does not dimensionally comply with the ISO 6431/VDMA 24562 or ISO 6432 specifications.



RODLOK KITS

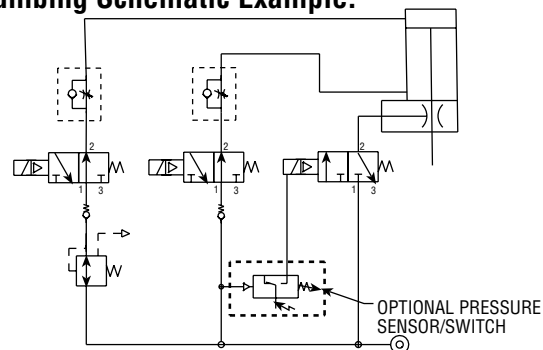


BORE mm	LOCKING DEVICE KIT	ADAPTOR KIT*	COMPLETE RODLOK*	IMPERIAL PORT ADAPTOR**
20	63459-07-1	63460-07-1	63461-07-1	—
25	63459-08-1	63460-08-1	63461-08-1	—
32	63459-01-1	63460-01-1	63461-01-1	63465-1
40	63459-02-1	63460-02-1	63461-02-1	63465-1
50	63459-03-1	63460-03-1	63461-03-1	63465-1
63	63459-04-1	63460-04-1	63461-04-1	63465-1
80	63459-05-1	63460-05-1	63461-05-1	63465-1
100	63459-06-1	63460-06-1	63461-06-1	63465-1

NOTES:

- * Kits ship with cylinder mounting hardware.
- Rodlok® is intended for use only on -H46 cylinder.
- Imperial port adaptor converts port from G1/8 to 1/8" NPT for use with -L9 cylinders or imperial units.
- ** Adaptor must be ordered separately. Required to convert to imperial port.

Plumbing Schematic Example:

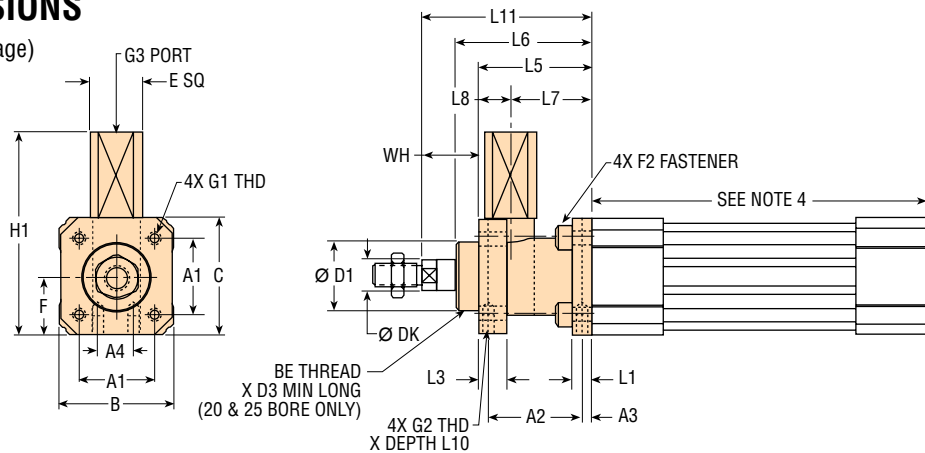


The pneumatic schematic above shows typical valving for cylinder and Rodlok for both horizontal and vertical operation. The schematic shows three 3/2 way valves, one for each port on the cylinder and one for the Rodlok port. The use of two valves on the cylinder allows for both ports to be pressurized when valves are de-energized. The use of an in-line regulator allows the cylinder ports to be pressurized at different pressures. This allows the cylinder to balance out the opposing pressure and force of the attached load. Once piston rod motion has stopped, the Rodlok can be engaged by de-energizing its valve and releasing its pressure. The use of check valves and built in PHD Port Controls® is recommended. Pressure switch shown is optional and application specific.

OPTIONS: SERIES CV CYLINDERS

RODLOK DIMENSIONS

(continued from previous page)



LETTER DIM	BORE SIZE															
	20 mm		25 mm		32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
A1	1.024	26.0	1.063	27.0	1.280	32.5	1.496	38.0	1.831	46.5	2.224	56.5	2.835	72.0	3.504	89.0
A2	—	—	—	—	1.575	40.0	1.811	46.0	2.126	54.0	2.165	55.0	2.756	70.0	2.756	70.0
A3	—	—	—	—	.165	4.2	.177	4.5	.453	11.5	.295	7.5	.394	10.0	.394	10.0
A4	—	—	—	—	.630	16.0	.827	21.0	.945	24.0	1.260	32.0	1.732	44.0	2.362	60.0
B	1.457	37.0	1.575	40.0	1.890	48.0	2.205	56.0	2.677	68.0	3.228	82.0	3.937	100.0	4.724	120.0
BE	M22 x 1.5		M22 x 1.5		—	—	—	—	—	—	—	—	—	—	—	—
C	1.457	37.0	1.575	40.0	1.969	50.0	2.283	58.0	2.756	70.0	3.346	85.0	4.134	105.0	5.118	130.0
D1	.866	22.0	.866	22.0	1.181	30.0	1.378	35.0	1.575	40.0	1.772	45.0	1.772	45.0	2.165	55.0
D3	.590	15.0	.669	17.0	—	—	—	—	—	—	—	—	—	—	—	—
DK	.315	8.0	.394	10.0	.472	12.0	.630	16.0	.787	20.0	.787	20.0	.984	25.0	.984	25.0
E	.807	20.5	.807	20.5	.984	25.0	1.083	27.5	1.280	32.5	1.614	41.0	1.929	49.0	2.087	53.0
F	.728	18.5	.787	20.0	.984	25.0	1.142	29.0	1.378	35.0	1.673	42.5	2.067	52.5	2.559	65.0
F2	M4 x 0.7 x 20		M4 x 0.7 x 20		M6 x 1 x 20		M6 x 1 x 20		M8 x 1.25 x 30		M8 x 1.25 x 30		M10 x 1.5 x 30		M10 x 1.5 x 30	
G1	M4 x 0.7		M4 x 0.7		M6 x 1		M6 x 1		M8 x 1.25		M8 x 1.25		M10 x 1.5		M10 x 1.5	
G2	—		—		M5		M5		M6		M8		M8		M8	
G3	M5 x 0.8		M5 x 0.8		G 1/8*		G 1/8*		G 1/8*		G 1/8*		G 1/8*		G 1/8*	
H1	2.795	71.0	2.854	72.5	3.346	85.0	3.839	97.5	4.626	117.5	5.256	133.5	6.752	171.5	7.441	189.0
L1	.354	9.0	.315	8.0	.315	8.0	.394	10.0	.591	15.0	.591	15.0	.630	16.0	.630	16.0
L3	.354	9.0	.315	8.0	.472	12.0	.472	12.0	.630	16.0	.591	15.0	.630	16.0	.709	18.0
L5	1.575	40.0	1.732	44.0	1.890	48.0	2.165	55.0	2.756	70.0	2.756	70.0	3.543	90.0	3.622	92.0
L6	2.244	57.0	2.480	63.0	2.283	58.0	2.559	65.0	3.228	82.0	3.228	82.0	4.331	110.0	4.528	115.0
L7	1.142	29.0	1.220	31.0	1.260	32.0	1.398	35.5	1.929	49.0	1.929	49.0	2.441	62.0	2.559	65.0
L8	.433	11.0	.512	13.0	.630	16.0	.768	19.5	.827	21.0	.827	21.0	1.102	28.0	1.063	27.0
L10	—	—	—	—	.315	8.0	.394	10.0	.472	12.0	.472	12.0	.630	16.0	.630	16.0
L11	2.520	64.0	2.835	72.0	2.913	74.0	3.346	85.0	4.213	107.0	4.213	107.0	5.354	136.0	5.630	143.0
WH	.945	24.0	1.102	28.0	1.024	26.0	1.181	30.0	1.457	37.0	1.457	37.0	1.811	46.0	2.008	51.0

NOTES:

- 1) -H47 units have Rodlok port aligned with cylinder port on extend.
- 2) See pages 1-34 and 1-35 for complete cylinder dimensions.
- 3) * = Port supplied on Rodlok device, requires port adaptor from page 1-37 to convert to 1/8 NPT.
- 4) All dimensions not noted are standard. See pages 1-34 and 1-35 for complete cylinder dimensions.

L9 NPT PORTS (Metric Units)

This option provides NPT ports instead of the standard G (BSPP) ports. The NPT ports are located in the same location as the G (BSPP) ports.

⊕ This option does not dimensionally comply with the ISO 6431/VDMA 24562 or ISO 6432 specifications.

L7 BSPP PORTS (Imperial Units)

This option provides G (BSPP) ports instead of the standard NPT ports. The G (BSPP) ports are located in the same location as the NPT ports.

BORE [mm]	IMPERIAL NPT PORT	METRIC BSPP PORT
20	1/8*	G 1/8*
25	1/8*	G 1/8*
32	1/8	G 1/8
40	1/4	G 1/4
50	1/4	G 1/4
63	3/8	G 3/8
80	3/8	G 3/8
100	1/2	G 1/2

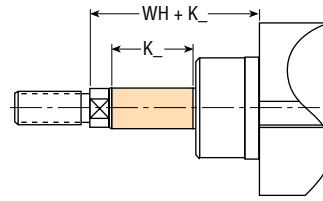
*When Port Controls® (-PB, -PR, -PE) are specified on the same face as port, the ports change to M5 on metric and 10-32 on imperial.

OPTIONS: SERIES CV CYLINDERS

K EXTRA ROD EXTENSION ⊕

Extra rod extension can be achieved by specifying the option -K followed by the length code. Rod extension is available in 1/8" or 5 mm increments. If this option is specified on double rod units, both rod ends will be supplied with the same extra rod extension. Contact PHD for other combinations.

Imperial		Metric	
K5 = 5/8" extra rod extension		K5 = 5 mm extra rod extension	
K15 = 1-7/8" extra rod extension		K15 = 15 mm extra rod extension	



⊕ For metric units (CVxx6). This option does not dimensionally comply with the ISO 6431/VDMA 24562 or ISO 6432 specifications.

BORE [mm]	WH	
	in	mm
20	0.945	24.0
25	1.102	28.0
32	1.024	26.0
40	1.181	30.0
50	1.457	37.0
63	1.457	37.0
80	1.811	46.0
100	2.008	51.0

Z1 CORROSION RESISTANT

By specifying this option, a stainless steel rod with hard chrome plating is supplied in place of the standard hard chrome plated steel material. Appropriate coating is supplied on ferrous parts.

M MAGNET FOR PHD MINIATURE REED AND SOLID STATE SWITCHES

This option equips the cylinder with a magnetic band on the piston for use with PHD Miniature Reed and Solid State Switches listed below. These switches mount easily to the cylinder using "T" slots in the body. See Switches and Sensors section for complete switch information. Three position units will receive a magnet on both cylinder 1 and cylinder 2 when specified with -M option.

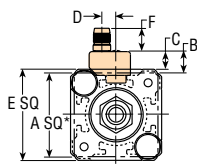
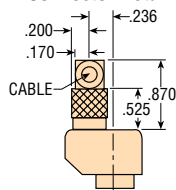
SERIES 6250 SOLID STATE SWITCHES

PART NO.	DESCRIPTION	COLOR
62505-1-02	NPN (Sink) DC Solid State, 2 m cable	Brown
62506-1-02	PNP (Source) DC Solid State, 2 m cable	Tan
62515-1	NPN (Sink) DC Solid State, Quick Connect	Brown
62516-1	PNP (Source) DC Solid State, Quick Connect	Tan

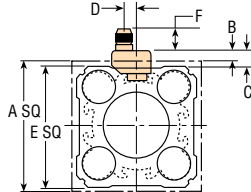
SERIES 6250 REED SWITCHES

PART NO.	DESCRIPTION	COLOR
62507-1-02	AC/DC Reed, 2 m cable	Silver
62517-1	AC/DC Reed, Quick Connect	Silver

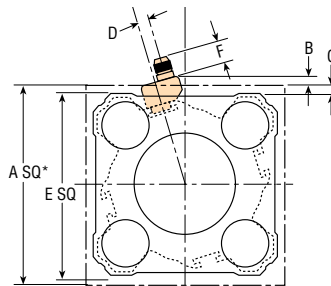
Connector Detail



20 & 25 mm units

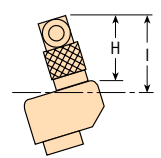


32, 40, & 50 mm units



63, 80, & 100 mm units

Connector Detail



LETTER DIM	BORE SIZE															
	20 mm		25 mm		32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
A*	1.339	34.0	1.339	34.0	1.969	50.0	2.283	58.0	2.756	70.0	3.346	85.0	4.134	105.0	5.118	130.0
B	.343	8.7	.441	11.2	.276	7.0	.197	5.0	.236	6.0	.236	6.0	.157	4.0	.020	0.5
C	.283	7.2	.323	8.2	.295	7.5	.256	6.5	.276	7.0	.335	8.5	.295	7.5	.315	8.0
D	.236	6.0	.236	6.0	.236	6.0	.236	6.0	.236	6.0	.236	6.0	.236	6.0	.236	6.0
E	1.457	37.0	1.575	40.0	1.949	49.5	2.205	56.0	2.697	68.5	3.150	80.0	3.858	98.0	4.528	115.0
F	.374	9.5	.374	9.5	.374	9.5	.374	9.5	.374	9.5	.374	9.5	.374	9.5	.374	9.5
G	—	—	—	—	—	—	—	—	—	—	17°	17°	20°	20°	24°	24°
H	.870	22.1	.870	22.1	.870	22.1	.870	22.1	.870	22.1	.831	21.1	.819	20.8	.795	20.2
I	1.213	30.8	1.311	33.3	1.146	29.1	1.087	27.6	1.106	28.1	1.059	26.9	.965	24.5	.811	20.6

NOTE: *ISO/VDMA max square size

All dimensions are reference only unless specifically toleranced.

OPTIONS: SERIES CV CYLINDERS

PB

PORT CONTROLS® ON BOTH ENDS

(standard location 1 & 5, see note) ⊕

PE

PORT CONTROLS® ON EXTEND ONLY

(standard location 1, not available on 3 position units) ⊕

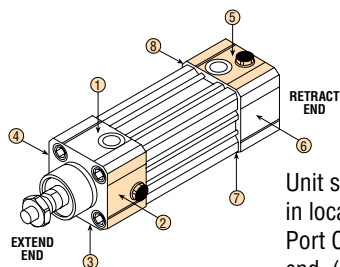
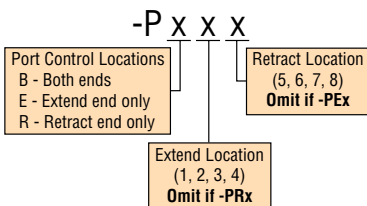
PR

PORT CONTROLS® ON RETRACT ONLY

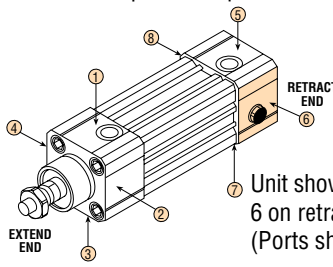
(standard location 5, not available on 3 position units) ⊕

PHD's Port Control® is a built-in flow control for regulating the speed of the cylinder through its entire stroke. The Port Control operates on the "meter-out" principle and features an adjustable needle in a cartridge with a check seal. The self-locking needle has micrometer threads and is adjustable under pressure. The needle determines the orifice size which controls the exhaust flow rate of the actuator. The check seal expands while air is exhausting from the actuator, forcing the air to exhaust past the adjustable needle. The check seal collapses to allow a free flow of incoming air. The PHD Port Control saves space and eliminates the cost of fittings and installation for external flow control valves. See engineering data for cylinder speeds with PHD's Port Controls. Refer to option code below to specify port control locations. Three position port control locations are 1 and 5 only and will receive a control on the head, intermediate head, and cap.

PORT CONTROL OPTIONS



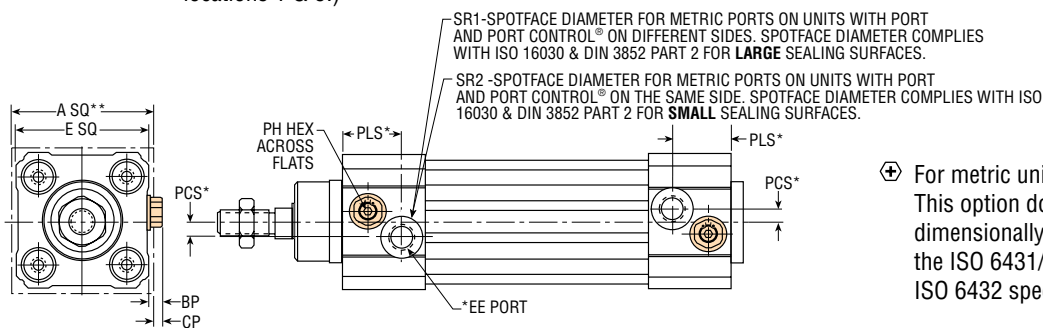
Unit shown is -PB25, Port Control® in location 2 on extend end and Port Control in location 5 on retract end. (Ports shown in standard locations 1 & 5.)



Unit shown is -PR6, Port Control in location 6 on retract end and none on extend end. (Ports shown in standard locations 1 & 5.)

NOTE: Port Controls are not available on same end which has -UB0x or -UBx0 (four ports) specified. Port Controls on 3 position units are available only with -PB option in locations 1 and 5 only.

⊕ For 32, 40, 50, and 63 mm, the Port Control extends beyond VDMA specified square size. See dimension BP.



⊕ For metric units (CVxx6). This option does not dimensionally comply with the ISO 6431/VDMA 24562 or ISO 6432 specifications.

LETTER	BORE SIZE															
	20 mm		25 mm		32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
A**	1.339	34.0	1.339	34.0	1.969	50.0	2.283	58.0	2.756	70.0	3.346	85.0	4.134	105.0	5.118	130.0
BP	.125	3.2	.153	3.9	.177	4.5	.240	6.1	.110	2.8	.201	5.1	.134	3.4	.205	5.2
CP	.184	4.7	.271	6.9	.169	4.3	.201	5.1	.083	2.1	.102	2.6	-.004	-0.1	-.091	-2.3
E	1.457	37.0	1.575	40.0	1.949	49.5	2.205	56.0	2.697	68.5	3.150	80.0	3.858	98.0	4.528	115.0
EE*	10-32	M5	10-32	M5	1/8 NPT	G1/8	1/4 NPT	G1/4	1/4 NPT	G1/4	3/8 NPT	G3/8	3/8 NPT	G3/8	1/2 NPT	G1/2
PCS*	.276	7.0	.276	7.0	.197	5.0	.236	6.0	.236	6.0	.449	11.4	.512	13.0	.906	23.0
PH	—	2.5	—	2.5	—	2.5	—	2.5	—	2.5	—	3.0	—	3.0	—	6.0
PLS*	.571	14.5	.571	14.5	.866	22.0	.925	23.5	.906	23.0	.984	25.0	1.024	26.0	1.142	29.0
SR1	—	16.5	—	16.5	—	19.0	—	25.0	—	25.0	—	28.0	—	28.0	—	34.0
SR2	.354	9.0	.354	9.0	—	16.5	—	19.0	—	19.0	—	23.0	—	23.0	—	27.0

NOTES:

- *Port dimensions shown are for units with port and Port Control® in the same location. For units with other port and Port Control® combinations, standard port size and location dimensions apply. Ports may be located on either side of the cylinder centerline depending on Port Control® and cushion option combinations.
in = Table information for imperial ports mm = Table information for metric ports
- **VDMA max square size

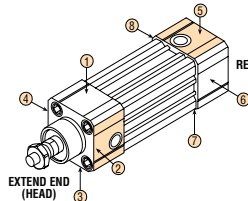
All dimensions are reference only unless specifically toleranced.

OPTIONS: SERIES CV CYLINDERS

UB ALTERNATE PORT LOCATION

(not available on 3 position units)

With this option, alternate port locations can be specified, providing increased flexibility and customer convenience. See option code below to specify port locations. Three position units available with ports in standard locations 1 and 5 only.



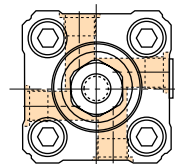
Unit shown is -UB25, port in location 2 on extend end and port in location 5 on retract end.

PORT LOCATION OPTIONS

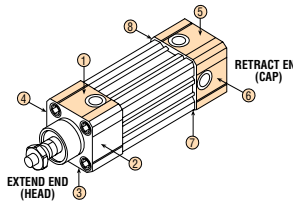
-UB x x

Extend Location (Head)
(0, 1, 2, 3, 4)
0 = All four sides

Retract Location (Cap)
(0, 5, 6, 7, 8)
0 = All four sides



PORTS ON ALL 4 SIDES (0 IN PORT OPTION CODE) NOT AVAILABLE WITH PHD PORT CONTROLS ON SAME END



Unit shown is -UB10, port in location 1 on extend end, and ports on all 4 sides on retract end. (Not available with PHD port controls on retract.)

T44 FEMALE ROD END

This option provides a female rod end in place of the standard male rod end. See catalog dimensional pages for standard rod ends. This rod end deviates from ISO 6431/VDMA 24562 or ISO 6432 on metric units (CVxx6).

Double rod units will receive the same rod end on both rods unless otherwise specified as shown in the double rod option description.

TEE MALE OVERSIZE ROD END

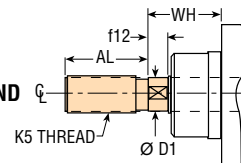
(N/A on 20 & 25 mm Bores)

This option provides a male oversize thread rod end in place of the standard male rod end. See catalog dimensional pages for standard rod ends. Double rod units will receive the same rod end on both rods unless otherwise specified as shown in the double rod option description.

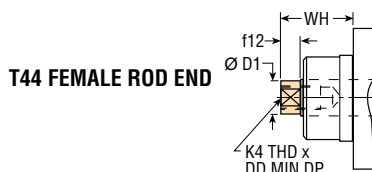
T55 PLAIN ROD END

This option provides a plain rod end with wrench flats. Standard PHD Series CV Cylinders are supplied with a male rod end. This rod end deviates from ISO 6431/VDMA 24562 or ISO 6432 on metric units (CVxx6).

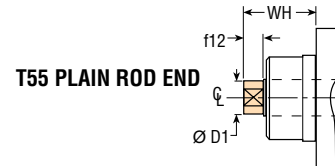
Double rod units will receive the same rod end on both rods unless otherwise specified as shown in the double rod option description.



TEE MALE OVERSIZE ROD END



T44 FEMALE ROD END

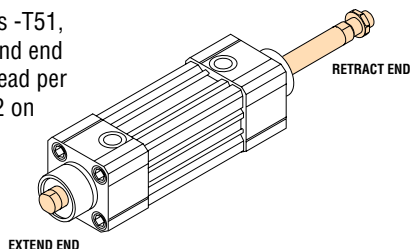


T55 PLAIN ROD END

LETTER DIM	BORE SIZE															
	20 mm		25 mm		32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
AL	—	—	—	—	.827	21.0	.906	23.0	1.220	31.0	1.220	31.0	1.535	39.0	1.535	39.0
D1	.315	8.00	.375*	9.53*	.447	11.35	.599	15.22	.757	19.23	.757	19.23	.954	24.23	.954	24.23
f12	.197	5.0	.236	6.0	.236	6.0	.256	6.5	.315	8.0	.315	8.0	.394	10.0	.394	10.0
K4	#10-32	M5 x 0.8	1/4-28	M6 x 1.0	5/16-24	M8 x 1.25	7/16-20	M10 x 1.5	1/2-20	M12 x 1.75	1/2-20	M12 x 1.75	5/8-11	M16 x 2.0	5/8-11	M16 x 2.0
K5	—	—	—	—	7/16-20	M12 x 1.25	5/8-18	M16 x 1.5	3/4-16	M20 x 1.5	3/4-16	M20 x 1.5	1-12	M24 x 3	1-12	M24 x 3
DD min	.413	10.5	.492	12.5	.551	14.0	.669	17.0	.748	19.0	.748	19.0	.827	21.0	.827	21.0
WH	.945	24.0	1.102	28.0	1.024	26.0	1.181	30.0	1.457	37.0	1.457	37.0	1.811	46.0	2.008	51.0

*Dimension shown is for -T44 rod end only. -T55 option dimension is .394 in [10.0 mm].

Unit shown is -T51, plain on extend end and male thread per VDMA 24562 on retract end.



DOUBLE ROD END OPTIONS

-T x x

Extend End
1 = Male thread VDMA 24562 (Standard)
4 = Female undersized thread
5 = Plain
E = Male oversized thread

Retract End
1 = Male thread VDMA 24562 (Standard)
4 = Female undersized thread
5 = Plain
E = Male oversized thread

⊕ For metric units (CVxx6). This option does not dimensionally comply with the ISO 6431/VDMA 24562 or ISO 6432 specifications.

All dimensions are reference only unless specifically toleranced.

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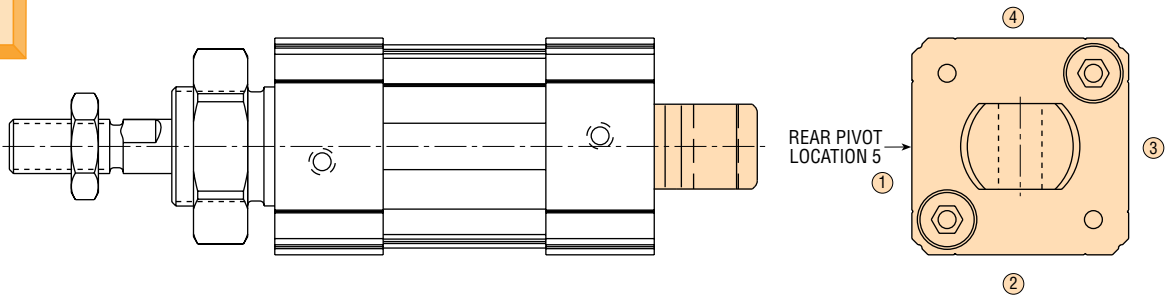
MOUNTING STYLES: SERIES CV CYLINDERS

P&Q PIVOT MOUNT ON SIZES 20 & 25 ONLY

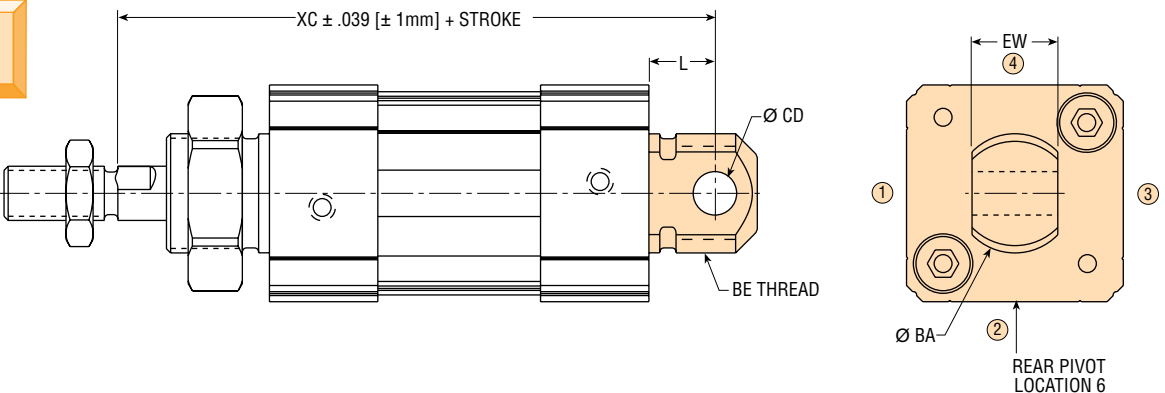
This style specifies a pivot mount cap. This style conforms to ISO 6432 customer interface and overall unit length on metric units (CVxx6) when specified with optional -P or -Q mounting. Pivot pins and base mounting brackets are available, see mounting accessories.

LETTER DIM/ TOLERANCE	BORE SIZE			
	20 mm		25 mm	
	in	mm	in	mm
BA	0.866	22.0	0.866	22.0
BE	M22 x 1.5		M22 x 1.5	
CD/H9	0.315	8.0	0.315	8.0
EW/d13	0.630	16.0	0.630	16.0
L MIN	0.472	12.0	0.472	12.0
XC CVB	4.055	103.0	4.330	110.0
XC CVC	3.740	95.0	4.094	104.0

P



Q



Port Position: Indicated by circled numbers

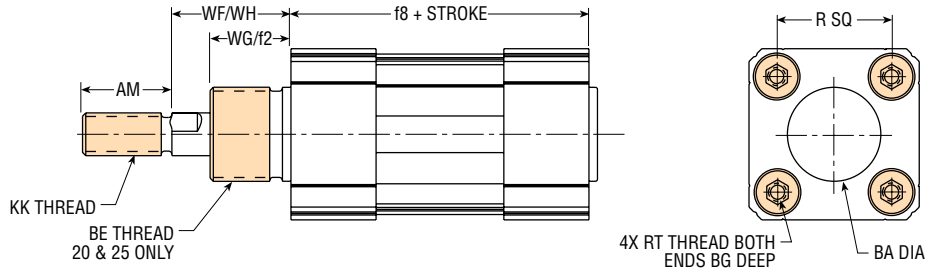
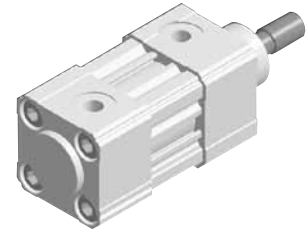
All dimensions are reference only unless specifically toleranced.

MOUNTING STYLES: SERIES CV CYLINDERS



STANDARD MOUNTING

(ISO 6431/VDMA 24562 & ISO 6432 for metric units CVxx6)



LETTER DIM/ TOLERANCE	BORE SIZE															
	20 mm		25 mm		32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
AM	0.748	19.0	0.827	21.0	0.827	21.0	0.906	23.0	1.220	31.0	1.220	31.0	1.535	39.0	1.535	39.0
BA	0.866	22.0	0.866	22.0	1.181	30.0	1.378	35.0	1.575	40.0	1.772	45.0	1.772	45.0	2.165	55.0
BE	M22 x 1.5		M22 x 1.5		—		—		—		—		—		—	
BG min	0.472	12.0	0.472	12.0	0.709	18.0	0.709	18.0	0.787	20.0	0.787	20.0	0.787	20.0	0.787	20.0
f8 CVA	—	—	—	—	3.701	94.0	4.134	105.0	4.173	106.0	4.764	121.0	5.039	128.0	5.433	138.0
f8 CVB	2.638	67.0	2.756	70.0	—	—	—	—	—	—	—	—	—	—	—	—
f8 CVC	2.323	59.0	2.520	64.0	—	—	—	—	—	—	—	—	—	—	—	—
KK	5/16-24	M8 x 1.25	3/8-24	M10 x 1.25	3/8-24	M10 x 1.25	1/2-20	M12 x 1.25	5/8-18	M16 x 1.5	5/8-18	M16 x 1.5	3/4-16	M20 x 1.5	3/4-16	M20 x 1.5
R	1.024	26.0	1.063	27.0	1.280	32.5	1.496	38.0	1.831	46.5	2.224	56.5	2.835	72.0	3.504	89.0
RT	M4 x 0.7		M4 x 0.7		M6 x 1		M6 x 1		M8 x 1.25		M8 x 1.25		M10 x 1.5		M10 x 1.5	
WF	0.945	24.0	1.102	28.0	—	—	—	—	—	—	—	—	—	—	—	—
WH	—	—	—	—	1.024	26.0	1.181	30.0	1.457	37.0	1.457	37.0	1.811	46.0	2.008	51.0
WG	0.669	17.0	0.748	19.0	—	—	—	—	—	—	—	—	—	—	—	—
f2	—	—	—	—	0.728	18.5	0.807	20.5	1.083	27.5	1.083	27.5	1.319	33.5	1.437	36.5

All dimensions are reference only unless specifically toleranced.

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MOUNTING ACCESSORIES: SERIES CV CYLINDERS

SELF-ALIGNING PISTON ROD COUPLERS - METRIC

CV



New metric rod couplers are an ideal accessory for use with Series CV ISO/VDMA cylinders.

To order, specify the model number.



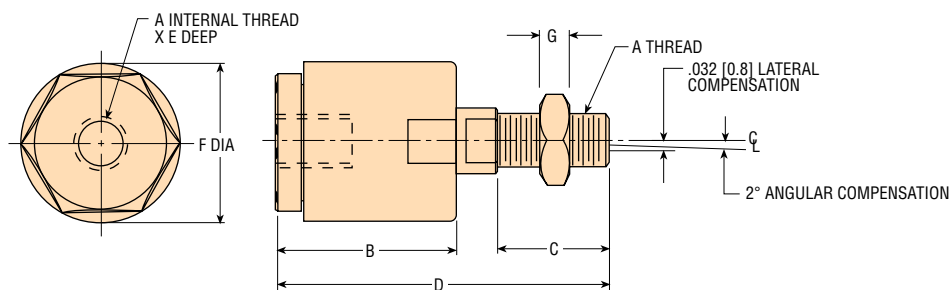
BENEFITS

- Rod Couplers eliminate expensive precision machining for mounting fixed or rigid cylinder on guide or slide applications.
- Cylinder efficiency is increased by eliminating friction caused by misalignment. Couplers compensate for 2° angular error and 1/32" [0.8 mm] lateral misalignment on push and pull stroke.
- Couplers provide greater reliability and reduce cylinder and component wear, simplifying alignment problems in the field.
- Rod Couplers are manufactured from high tensile and hardened steel components.

MODEL NO. IMPERIAL METRIC	LETTER DIMENSION						G		CV CYLINDER BORE*	
	A	B min	C min	D min	E	F	IMPERIAL	METRIC	IMPERIAL	METRIC
312 M8	5/16-24 [M8 x 1.25]	1.00 [25.4]	0.625 [15.9]	1.875 [47.6]	0.500 [12.7]	0.875 [22.2]	.187	.197 [5.0]	20	20
375 M10	3/8-24 [M10 x 1.25]	1.00 [25.4]	.625 [15.9]	1.875 [47.6]	.50 [12.7]	.875 [22.2]	.219	.197 [5.0]	25, 32	25, 32
437 —	7/16-20	1.13	.650	2.187	.50	1.0	.250	—	—	—
500 M12	1/2-20 [M12 x 1.25]	1.13 [28.6]	.650 [16.5]	2.187 [55.5]	.50 [12.7]	1.0 [25.4]	.312	.236 [6.0]	40	40
625 M16	5/8-18 [M16 x 1.5]	1.75 [44.5]	1.125 [28.5]	3.312 [84.1]	.812 [20.6]	1.562 [39.7]	.375	.314 [8.0]	50, 63	50, 63
750 M20	3/4-16 [M20 x 1.5]	1.75 [44.5]	1.125 [28.5]	3.312 [84.1]	.812 [20.6]	1.562 [39.7]	.421	.394 [10.0]	80, 100	80, 100

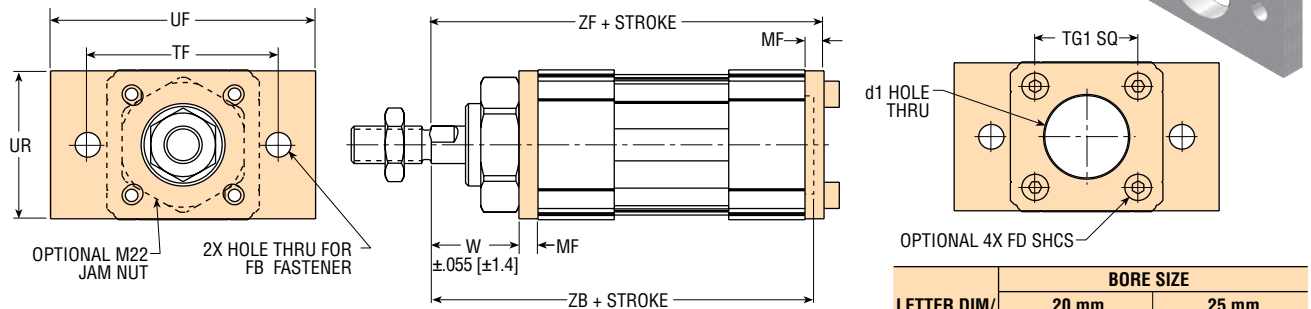
NOTES:

- 1) NUMBERS IN [] ARE mm. IMPERIAL EQUIVALENTS ARE PROVIDED FOR CONVENIENCE.
- 2) *UNITS SHOWN ARE WITH STANDARD ROD ENDS. OPTIONAL ROD ENDS MAY USE OTHER MODEL NUMBERS.



MOUNTING ACCESSORIES: SERIES CV CYLINDERS

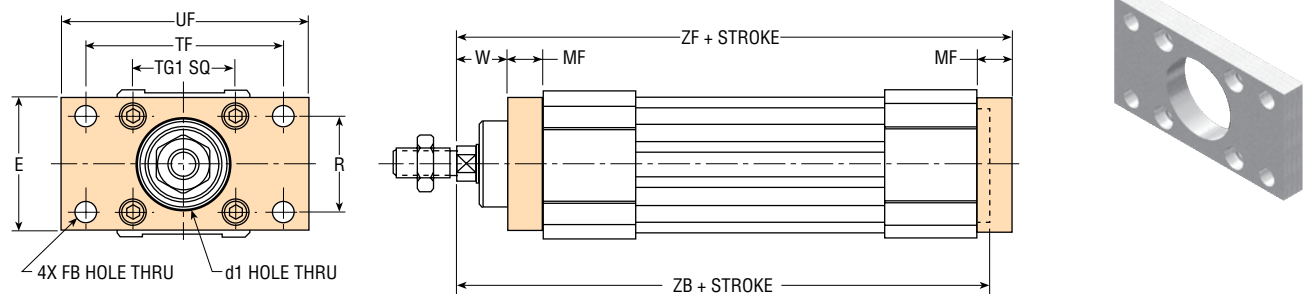
RECTANGULAR FLANGE MOUNTING KIT SIZES 20 & 25 mm (MF8 PER ISO 6432)



LETTER DIM/ TOLERANCE	BORE SIZE			
	20 mm		25 mm	
	in	mm	in	mm
d1/H11	0.866	22.0	0.866	22.0
FB/H13	M6 x 1.0		M6 x 1.0	
FD	M4 x 0.7 x 18		M4 x 0.7 x 18	
TG1	1.024	26.0	1.063	27.0
MF	0.197	5.0	0.197	5.0
TF/Js14	1.969	50.0	1.969	50.0
UF max	2.756	70.0	2.756	70.0
UR max	1.575	40.0	1.575	40.0
W	0.748	19.0	0.906	23.0
CVB				
ZB max	3.504	89.0	3.858	98.0
ZF	3.701	94.0	4.055	103.0
CVC				
ZB max	3.189	81.0	3.622	92.0
ZF	3.386	86.0	3.819	97.0
Kit No.	52484-07-1		52484-07-1	
-Z1 Kit No.	52484-07-3		52484-07-3	

NOTE: Kits include flange and cylinder mounting hardware for one end only.

SIZES 32-100 mm (MF1/MF2 PER VDMA 24562)



LETTER DIM/ TOLERANCE	BORE SIZE											
	32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
d1/H11	1.181	30.0	1.378	35.0	1.575	40.0	1.772	45.0	1.772	45.0	2.165	55.0
FB/H13	.276	7.0	.354	9.0	.354	9.0	.354	9.0	.472	12.0	.551	14.0
TG1	1.280	32.5	1.496	38.0	1.831	46.5	2.224	56.5	2.835	72.0	3.504	89.0
E max	1.969	50.0	2.283	58.0	2.756	70.0	3.346	85.0	4.134	105.0	5.118	130.0
R/JS14	1.260	32.0	1.417	36.0	1.772	45.0	1.969	50.0	2.480	63.0	2.953	75.0
MF	.394	10.0	.394	10.0	.472	12.0	.472	12.0	.630	16.0	.630	16.0
TF/JS14	2.520	64.0	2.835	72.0	3.543	90.0	3.937	100.0	4.961	126.0	5.906	150.0
UF max	3.386	86.0	3.780	96.0	4.528	115.0	5.118	130.0	6.496	165.0	7.362	187.0
Fastener	M6 x 1 x 20		M6 x 1 x 20		M8 x 1.25 x 20		M8 x 1.25 x 20		M10 x 1.25 x 25		M10 x 1.25 x 25	
W	.630	16.0	.787	20.0	.984	25.0	.984	25.0	1.181	30.0	1.378	35.0
ZB max	4.882	124.0	5.591	142.0	5.866	149.0	6.496	165.0	7.165	182.0	7.795	198.0
ZF	5.118	130.0	5.709	145.0	6.102	155.0	6.693	170.0	7.480	190.0	8.071	205.0
Kit No.	52484-01-1		52484-02-1		52484-03-1		52484-04-1		52484-05-1		52484-06-1	
-Z1 Kit No.	52484-01-3		52484-02-3		52484-03-3		52484-04-3		52484-05-3		52484-06-3	

NOTE: Kits include flange and cylinder mounting hardware for one end only.

All dimensions are reference only unless specifically toleranced.

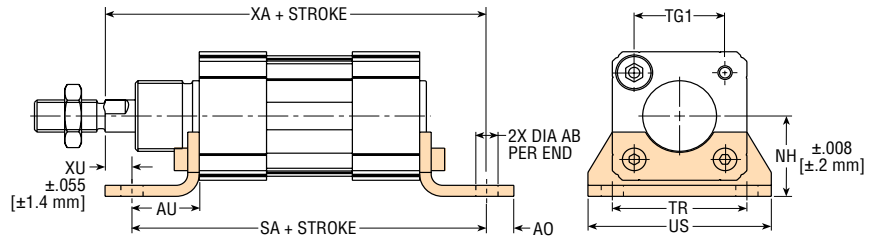
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MOUNTING ACCESSORIES: SERIES CV CYLINDERS

BASE MOUNTING KIT SIZES 20 & 25 mm (MS3 PER ISO 6432)

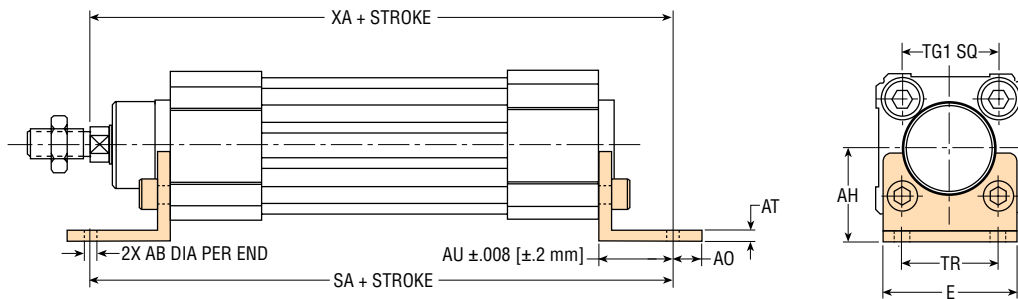
CV

LETTER DIM/ TOLERANCE	BORE SIZE			
	20 mm		25 mm	
	in	mm	in	mm
AB/H13	0.260	6.6	0.260	6.6
AO max	0.315	8.0	0.315	8.0
AU max	0.787	20.0	0.787	20.0
NH	0.984	25.0	0.984	25.0
SA CVB	4.213	107.0	4.330	110.0
SA CVC	3.898	99.0	4.094	104.0
TG1	1.024	26.0	1.063	27.0
TR/Js14	1.575	40.0	1.575	40.0
US max	2.165	55.0	2.165	55.0
XA CVB	4.370	111.0	4.645	118.0
XA CVC	4.055	103.0	4.409	112.0
XU	0.157	4.0	0.315	8.0
Kit No.	52487-07-1		52487-07-1	
-Z1 Kit No.	52487-07-3		52487-07-3	



Kit can only be mounted in orientation shown.

SIZES 32-100 mm (MS1 PER VDMA 24562)



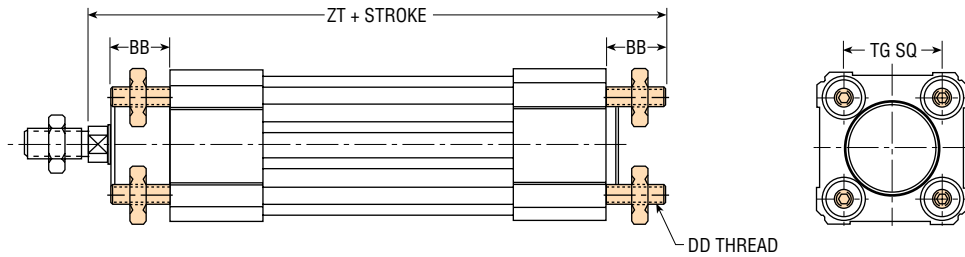
LETTER DIM/ TOLERANCE	BORE SIZE											
	32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
AB	.270	6.87	.369	9.37	.369	9.37	.369	9.37	.449	11.41	.538	13.66
TG1	1.280	32.5	1.496	38.0	1.831	46.5	2.224	56.5	2.835	72.0	3.504	89.0
E max	1.969	50.0	2.283	58.0	2.756	70.0	3.346	85.0	4.134	105.0	5.118	130.0
TR	1.260	32.0	1.417	36.0	1.772	45.0	1.969	50.0	2.480	63.0	2.953	75.0
AO max	.433	11.0	.591	15.0	.591	15.0	.591	15.0	.787	20.0	.984	25.0
AU	.945	24.0	1.102	28.0	1.260	32.0	1.260	32.0	1.614	41.0	1.614	41.0
AH	1.260	32.0	1.417	36.0	1.772	45.0	1.969	50.0	2.480	63.0	2.795	71.0
AT	.177	4.5	.177	4.5	.217	5.5	.217	5.5	.256	6.5	.256	6.5
SA	5.591	142.0	6.339	161.0	6.693	170.0	7.283	185.0	8.268	210.0	8.661	220.0
XA	5.669	144.0	6.417	163.0	6.890	175.0	7.480	190.0	8.465	215.0	9.055	230.0
Fastener	M6 x 1 x 20		M6 x 1 x 20		M8 x 1.25 x 25		M8 x 1.25 x 25		M10 x 1.5 x 25		M10 x 1.5 x 25	
Kit No.	52487-01-1		52487-02-1		52487-03-1		52487-04-1		52487-05-1		52487-06-1	
-Z1 Kit No.	52487-01-3		52487-02-3		52487-03-3		52487-04-3		52487-05-3		52487-06-3	

NOTE: Kits include bracket and cylinder mounting hardware for one end only.

MOUNTING ACCESSORIES: SERIES CV CYLINDERS

CV

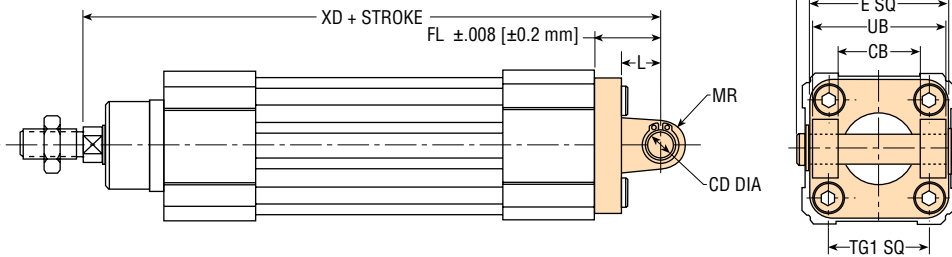
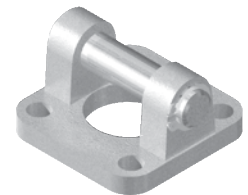
FASTENER MOUNTING KIT SIZES 20 & 25 mm (MX1) SIZES 32-100 mm (MX1 PER ISO 6431)



LETTER DIM	BORE SIZE															
	20 mm		25 mm		32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
BB min	0.512	13.0	0.512	13.0	.669	17.0	.669	17.0	.906	23.0	.906	23.0	1.102	28.0	1.102	28.0
DD	M4 x 0.7		M4 x 0.7		M6 x 1.0		M6 x 1.0		M8 x 1.25		M8 x 1.25		M10 x 1.5		M10 x 1.5	
ZT CVA	—	—	—	—	5.394	137.0	5.984	152.0	6.535	166.0	7.126	181.0	7.953	202.0	8.543	217.0
ZT CVB	4.095	104.0	4.370	111.0	—	—	—	—	—	—	—	—	—	—	—	—
ZT CVC	3.780	96.0	4.134	105.0	—	—	—	—	—	—	—	—	—	—	—	—
TG	1.024	26.0	1.063	27.0	1.280	32.5	1.496	38.0	1.831	46.5	2.224	56.5	2.835	72.0	3.504	89.0
Kit No.	63480-04-1		63480-04-1		63480-01-1		63480-01-1		63480-02-1		63480-02-1		63480-03-1		63480-03-1	
-Z1 Kit No.	63480-04-3		63480-04-3		63480-01-3		63480-01-3		63480-02-3		63480-02-3		63480-03-3		63480-03-3	

NOTE: Kit includes cylinder mounting hardware for one end only.

REAR FORK MOUNTING KIT SIZES 32-100 mm (MP2 PER VDMA 24562)



LETTER DIM/ TOLERANCE	BORE SIZE													
	32 mm		40 mm		50 mm		63 mm		80 mm		100 mm			
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm		
A max	2.559	65.0	2.835	72.0	3.150	80.0	3.740	95.0	4.528	115.0	5.315	135.0		
E max	1.969	50.0	2.283	58.0	2.756	70.0	3.346	85.0	4.134	105.0	5.118	130.0		
UB/h14	1.772	45.0	2.047	52.0	2.362	60.0	2.756	70.0	3.543	90.0	4.331	110.0		
CB/H14	1.024	26.0	1.102	28.0	1.260	32.0	1.575	40.0	1.969	50.0	2.362	60.0		
TG1	1.280	32.5	1.496	38.0	1.831	46.5	2.224	56.5	2.835	72.0	3.504	89.0		
FL	.866	22.0	.984	25.0	1.063	27.0	1.260	32.0	1.417	36.0	1.614	41.0		
L min	.472	12.0	.591	15.0	.591	15.0	.787	20.0	.787	20.0	.984	25.0		
CD/H9	.394	10.0	.472	12.0	.472	12.0	.630	16.0	.630	16.0	.787	20.0		
MR max	.433	11.0	.512	13.0	.512	13.0	.669	17.0	.669	17.0	.827	21.0		
XD	5.591	142.0	6.299	160.0	6.693	170.0	7.480	190.0	8.268	210.0	9.055	230.0		
Fastener	M6 x 1 x 20		M6 x 1 x 20		M8 x 1.25 x 20		M8 x 1.25 x 20		M10 x 1.5 x 25		M10 x 1.5 x 25			
Kit No.	52485-01-1		52485-02-1		52485-03-1		52485-04-1		52485-05-1		52485-06-1			
-Z1 Kit No.	52485-01-3		52485-02-3		52485-03-3		52485-04-3		52485-05-3		52485-06-3			

NOTES:

- Kit includes rear fork, cylinder mounting fasteners, pivot pin, and pivot pin retainer clips.
- Mounting is compatible with MP4 male hinge and BMP4 pillow block.

All dimensions are reference only unless specifically toleranced.

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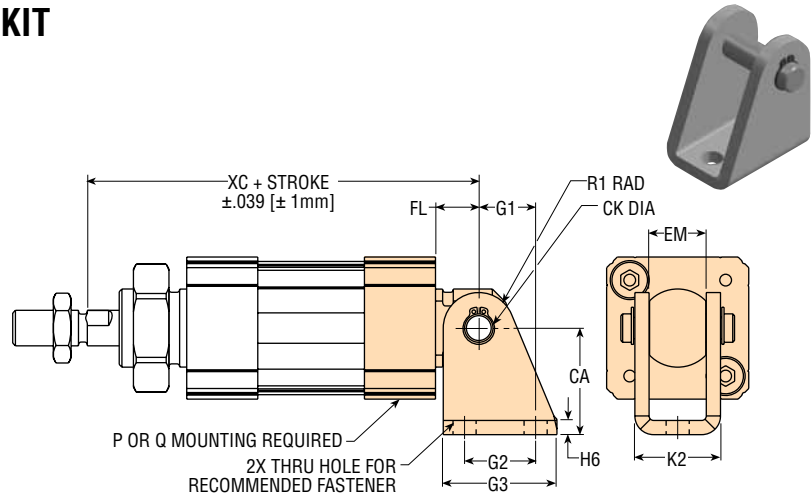
MOUNTING ACCESSORIES: SERIES CV CYLINDERS

REAR MALE HINGE MOUNTING KIT SIZES 20 & 25 mm

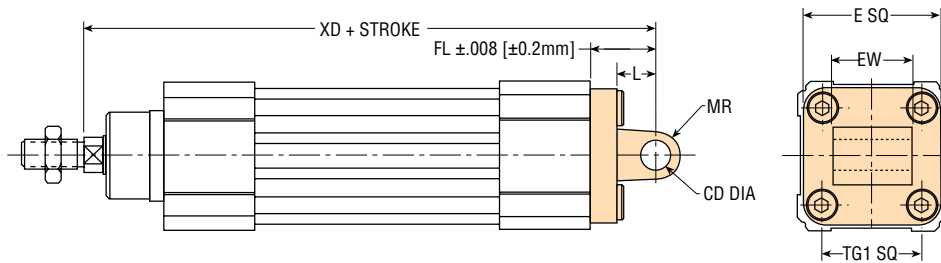
CV

LETTER DIM/ TOLERANCE	BORE SIZE			
	20 mm		25 mm	
	in	mm	in	mm
CA	1.181	30.0	1.181	30.0
CK	0.315	8.0	0.315	8.0
EM	0.634	16.1	0.634	16.1
FL min	0.472	12.0	0.472	12.0
G1	0.630	16.0	0.630	16.0
G2	0.787	20.0	0.787	20.0
G3	1.260	32.0	1.260	32.0
H6	0.157	4.0	0.157	4.0
K2	0.949	24.1	0.949	24.1
R1	0.394	10.0	0.394	10.0
XC CVB	4.055	103.0	4.330	110.0
XC CVC	3.740	95.0	4.094	104.0
Fastener	M6		M6	
Kit No.	65778-01-1		65778-01-1	
-Z1 Kit NO.	65778-01-3		65778-01-3	

NOTE: Kits include hinge bracket, retaining rings, pivot pins, and cylinder mounting fasteners when required.



SIZES 32-100 mm (MP4 PER VDMA 24562)



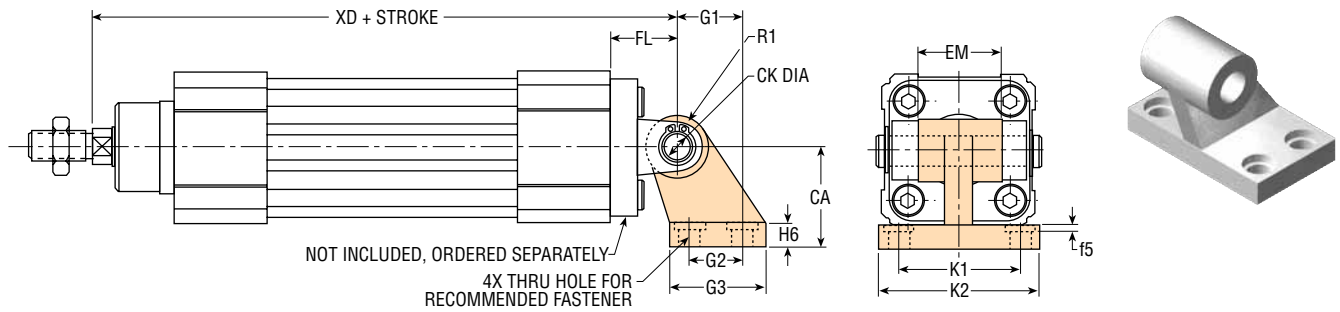
LETTER DIM/ TOLERANCE	BORE SIZE											
	32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
E max	1.969	50.0	2.283	58.0	2.756	70.0	3.346	85.0	4.134	105.0	5.118	130.0
EW max	1.024	26.0	1.102	28.0	1.260	32.0	1.575	40.0	1.969	50.0	2.362	60.0
TG1	1.280	32.5	1.496	38.0	1.831	46.5	2.224	56.5	2.835	72.0	3.504	89.0
FL	.866	22.0	.984	25.0	1.063	27.0	1.260	32.0	1.417	36.0	1.614	41.0
L min	.472	12.0	.591	15.0	.591	15.0	.787	20.0	.787	20.0	.984	25.0
CD/H9	.394	10.0	.472	12.0	.472	12.0	.630	16.0	.630	16.0	.787	20.0
MR max	.433	11.0	.512	13.0	.512	13.0	.669	17.0	.669	17.0	.827	21.0
XD	5.591	142.0	6.299	160.0	6.693	170.0	7.480	190.0	8.268	210.0	9.055	230.0
Fastener	M6 x 1 x 20		M6 x 1 x 20		M8 x 1.25 x 20		M8 x 1.25 x 20		M10 x 1.5 x 25		M10 x 1.5 x 25	
Kit No.	52486-01-1		52486-02-1		52486-03-1		52486-04-1		52486-05-1		52486-06-1	
-Z1 Kit No.	52486-01-3		52486-02-3		52486-03-3		52486-04-3		52486-05-3		52486-06-3	

NOTES:

- 1) Rear male hinge is compatible with MP2 mounting.
- 2) Kit includes hinge and cylinder mounting fasteners.

MOUNTING ACCESSORIES: SERIES CV CYLINDERS

PILLOW BLOCK MOUNTING WITH RIGID BEARINGS KIT (BMP4, CETOP RP 107P)

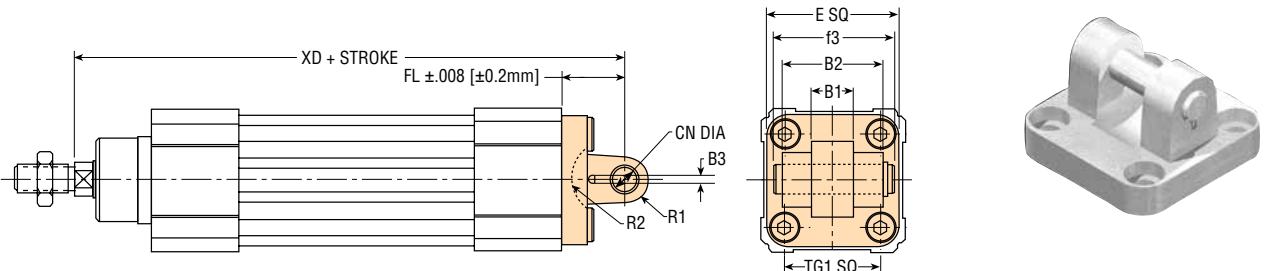


LETTER DIM/ TOLERANCE	BORE SIZE											
	32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
CK/H9	.394	10.0	.472	12.0	.472	12.0	.630	16.0	.630	16.0	.787	20.0
K1/JS14	1.496	38.0	1.614	41.0	1.969	50.0	2.047	52.0	2.598	66.0	2.992	76.0
K2 max	2.008	51.0	2.126	54.0	2.559	65.0	2.638	67.0	3.386	86.0	3.780	96.0
G1/JS14	.827	21.0	.945	24.0	1.299	33.0	1.457	37.0	1.850	47.0	2.165	55.0
f5 max	.063	1.6	.063	1.6	.063	1.6	.063	1.6	.098	2.5	.098	2.5
G2	.709	18.0	.866	22.0	1.181	30.0	1.378	35.0	1.575	40.0	1.969	50.0
EM max	1.016	25.8	1.094	27.8	1.252	31.8	1.567	39.8	1.961	49.8	2.354	59.8
G3 max	1.220	31.0	1.378	35.0	1.772	45.0	1.969	50.0	2.362	60.0	2.756	70.0
CA/JS15	1.260	32.0	1.417	36.0	1.772	45.0	1.969	50.0	2.480	63.0	2.795	71.0
H6	.315	8.0	.394	10.0	.472	12.0	.472	12.0	.551	14.0	.591	15.0
R1 max	.394	10.0	.433	11.0	.512	13.0	.591	15.0	.591	15.0	.748	19.0
FL	.866	22.0	.984	25.0	1.063	27.0	1.260	32.0	1.417	36.0	1.614	41.0
XD	5.591	142.0	6.299	160.0	6.693	170.0	7.480	190.0	8.268	210.0	9.055	230.0
Fastener	M6	M6	M6	M6	M8	M8	M8	M8	M10	M10	M10	M10
Kit No.	62818-001-00		62818-002-00		62818-003-00		62818-004-00		62818-005-00		62818-006-00	

NOTES:

- 1) Kit includes pillow block only (no pin or fasteners).
- 2) Pillow block is compatible with MP2 rear fork.

REAR FORK MOUNTING FOR SPHERICAL BEARING KIT (PHD MSB2 PER VDMA 24562)



LETTER DIM/ TOLERANCE	BORE SIZE											
	32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
E max	1.969	50.0	2.283	58.0	2.756	70.0	3.346	85.0	4.134	105.0	5.118	130.0
B2/d12	1.339	34.0	1.575	40.0	1.772	45.0	2.008	51.0	2.559	65.0	2.953	75.0
B1/H14	.551	14.0	.630	16.0	.827	21.0	.827	21.0	.984	25.0	.984	25.0
TG1	1.280	32.5	1.496	38.0	1.831	46.5	2.224	56.5	2.835	72.0	3.504	89.0
B3/*	.130	3.3	.169	4.3	.169	4.3	.169	4.3	.169	4.3	.248	6.3
R2 min	.669	17.0	.787	20.0	.866	22.0	.984	25.0	1.181	30.0	1.260	32.0
f3	1.811	46.0	2.087	53.0	2.283	58.0	2.598	66.0	3.150	80.0	3.543	90.0
FL	.866	22.0	.984	25.0	1.063	27.0	1.260	32.0	1.417	36.0	1.614	41.0
CN/F7	.394	10.0	.472	12.0	.630	16.0	.630	16.0	.787	20.0	.787	20.0
R1 max	.433	11.0	.512	13.0	.709	18.0	.709	18.0	.866	22.0	.866	22.0
XD	5.591	142.0	6.299	160.0	6.693	170.0	7.480	190.0	8.268	210.0	9.055	230.0
Fastener	M6 x 1 x 20		M6 x 1 x 20		M8 x 1.25 x 20		M8 x 1.25 x 20		M10 x 1.5 x 25		M10 x 1.5 x 25	
Kit No.	52489-01-1		52489-02-1		52489-03-1		52489-04-1		52489-05-1		52489-06-1	
-Z1 Kit No.	52489-01-3		52489-02-3		52489-03-3		52489-04-3		52489-05-3		52489-06-3	

NOTES:

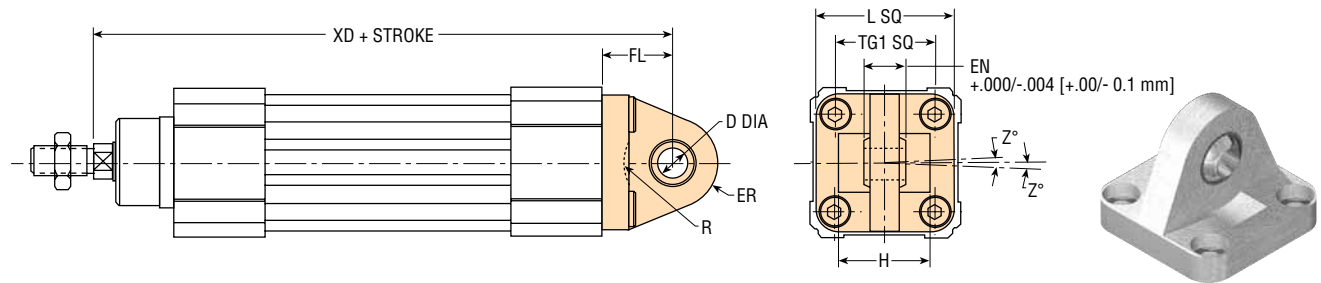
- 1) Kit includes rear fork cylinder mounting fastener pivot pin and retaining rings.
- 2) Rear fork is compatible with BSB1 pillow block, rod eye, and MSB1 rear male hinge with spherical bearings per DIN 648 K.

All dimensions are reference only unless specifically toleranced.

MOUNTING ACCESSORIES: SERIES CV CYLINDERS

REAR MALE HINGE MOUNTING WITH SPHERICAL BEARING KIT (PHD MSB1)

CV

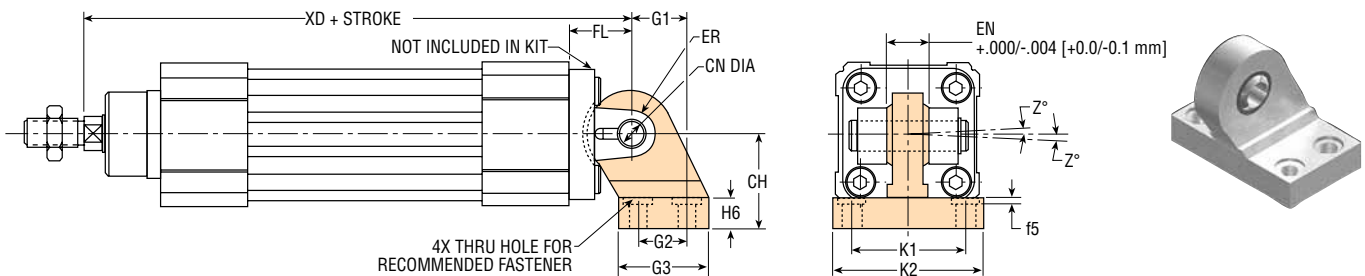


LETTER DIM/ TOLERANCE	BORE SIZE											
	32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
TG1	1.280	32.5	1.496	38.0	1.831	46.5	2.224	56.5	2.835	72.0	3.504	89.0
FL/JS15	.866	22.0	.984	25.0	1.063	27.0	1.260	32.0	1.417	36.0	1.614	41.0
D/H7	.394	10.0	.472	12.0	.630	16.0	.630	16.0	.787	20.0	.787	20.0
EN	.551	14.0	.630	16.0	.827	21.0	.827	21.0	.984	25.0	.984	25.0
ER max	.630	16.0	.748	19.0	.827	21.0	.945	24.0	1.102	28.0	1.181	30.0
L max	1.969	50.0	2.283	58.0	2.756	70.0	3.346	85.0	4.134	105.0	5.118	130.0
Z°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°
H	—	—	—	—	2.008	51.0	—	—	—	—	—	—
R	—	—	—	—	.748	19.0	—	—	—	—	—	—
XD	5.591	142.0	6.299	160.0	6.693	170.0	7.480	190.0	8.268	210.0	9.055	230.0
Fastener	M6 x 1 x 20		M6 x 1 x 20		M8 x 1.25 x 20		M8 x 1.25 x 20		M10 x 1.5 x 25		M10 x 1.5 x 25	
Kit No.	52488-01-1		52488-02-1		52488-03-1		52488-04-1		52488-05-1		52488-06-1	
-Z1 Kit No.	52488-01-3		52488-02-3		52488-03-3		52488-04-3		52488-05-3		52488-06-3	

NOTES:

- 1) Kit includes hinge and cylinder mounting fasteners.
- 2) Rear male hinge is compatible with MSB2 rear fork for spherical bearing.

PILLOW BLOCK MOUNTING WITH SPHERICAL BEARING KIT (PHD BSB1 PER VDMA 24562)



LETTER DIM/ TOLERANCE	BORE SIZE											
	32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
CN/H7	.394	10.0	.472	12.0	.630	16.0	.630	16.0	.787	20.0	.787	20.0
K1/JS 14	1.496	38.0	1.614	41.0	1.969	50.0	2.047	52.0	2.598	66.0	2.992	76.0
K2 max	2.008	51.0	2.126	54.0	2.559	65.0	2.638	67.0	3.386	86.0	3.780	96.0
G1/JS14	.827	21.0	.945	24.0	1.299	33.0	1.457	37.0	1.850	47.0	2.165	55.0
f5 max	.063	1.6	.063	1.6	.063	1.6	.063	1.6	.098	2.5	.098	2.5
G2/JS14	.709	18.0	.866	22.0	1.181	30.0	1.378	35.0	1.575	40.0	1.969	50.0
EN	.551	14.0	.630	16.0	.827	21.0	.827	21.0	.984	25.0	.984	25.0
G3 max	1.220	31.0	1.378	35.0	1.772	45.0	1.969	50.0	2.362	60.0	2.756	70.0
CH/JS15	1.260	32.0	1.417	36.0	1.772	45.0	1.969	50.0	2.480	63.0	2.795	71.0
H6	.394	10.0	.394	10.0	.472	12.0	.472	12.0	.551	14.0	.591	15.0
ER max	.630	16.0	.709	18.0	.827	21.0	.906	23.0	1.102	28.0	1.181	30.0
FL	.866	22.0	.984	25.0	1.063	27.0	1.260	32.0	1.417	36.0	1.614	41.0
XD	5.591	142.0	6.299	160.0	6.693	170.0	7.480	190.0	8.268	210.0	9.055	230.0
Z°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°	4°
Fastener	M6	M6	M6	M6	M8	M8	M8	M8	M10	M10	M10	M10
Kit No.	62822-001-00		62822-002-00		62822-003-00		62822-004-00		62822-005-00		62822-006-00	

NOTES:

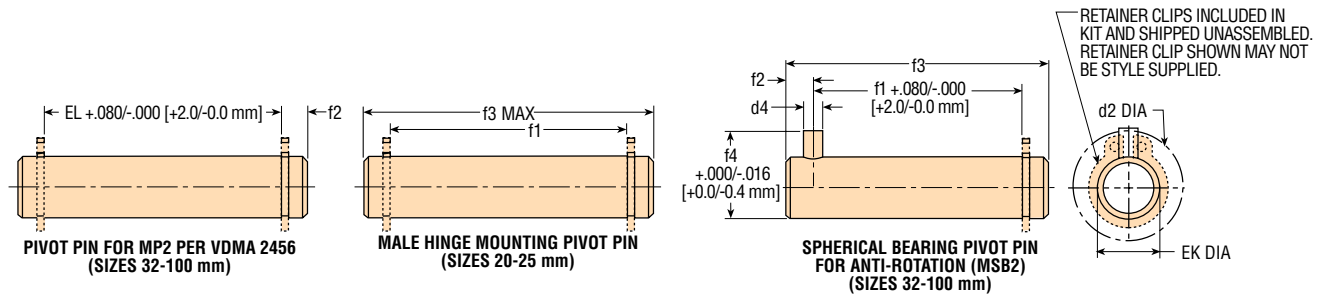
- 1) Kit includes pillow block only. No mounting fasteners
- 2) Pillow block is compatible with MSB2 rear fork for spherical bearing.
- 3) Not available in -Z1.

MOUNTING ACCESSORIES: SERIES CV CYLINDERS

PIVOT PIN KIT

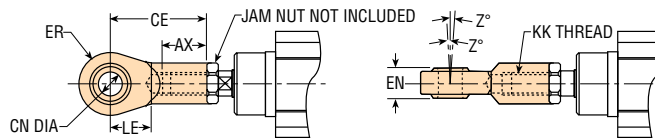


CV



LETTER DIM/ TOLERANCE	BORE SIZE															
	20 mm		25 mm		32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
MP2 PIVOT PIN																
d2 max	—	—	—	—	.906	23.0	.984	25.0	.984	25.0	1.260	32.0	1.260	32.0	1.575	40.0
EK/e8	—	—	—	—	.394	10.0	.472	12.0	.472	12.0	.630	16.0	.630	16.0	.787	20.0
EL	—	—	—	—	1.811	46.0	2.087	53.0	2.402	61.0	2.795	71.0	3.583	91.0	4.370	111.0
f2 max	—	—	—	—	.335	8.5	.335	8.5	.335	8.5	.433	11.0	.433	11.0	.433	11.0
Kit	—	—	—	—	52490-01-1		52490-02-1		52490-03-1		52490-04-1		52490-05-1		52490-06-1	
-Z1 Kit	—	—	—	—	52490-01-3		52490-02-3		52490-03-3		52490-04-3		52490-05-3		52490-06-3	
MALE HINGE PINS																
d2 max	—	—	—	—	.906	23.0	.984	25.0	.984	25.0	1.260	32.0	1.260	32.0	1.575	40.0
d4/H12	—	—	—	—	.118	3.0	.157	4.0	.157	4.0	.157	4.0	.157	4.0	.157	4.0
EK/h9	.315	8.0	.315	8.0	.394	10.0	.472	12.0	.630	16.0	.630	16.0	.787	20.0	.787	20.0
f1	.945	24.0	.945	24.0	1.280	32.5	1.496	38.0	1.693	43.0	1.929	49.0	2.480	63.0	2.874	73.0
f2 max	—	—	—	—	.177	4.5	.236	6.0	.236	6.0	.236	6.0	.236	6.0	.236	6.0
f3 max	1.260	32.0	1.260	32.0	1.811	46.0	2.087	53.0	2.283	58.0	2.598	66.0	3.150	80.0	3.543	90.0
f4	—	—	—	—	.551	14.0	.630	16.0	.787	20.0	.787	20.0	.945	24.0	.945	24.0
Kit No.	52491-07-1		52491-07-1		52491-01-1		52491-02-1		52491-03-1		52491-04-1		52491-05-1		52491-06-1	
-Z1 Kit No.	52491-07-3		52491-07-3		52491-01-3		52491-02-3		52491-03-3		52491-04-3		52491-05-3		52491-06-3	
MSB2 PIVOT PIN																
d2 max	—	—	—	—	.906	23.0	.984	25.0	.984	25.0	1.260	32.0	1.260	32.0	1.575	40.0
d4/H12	—	—	—	—	.118	3.0	.157	4.0	.157	4.0	.157	4.0	.157	4.0	.157	4.0
EK/h9	.315	8.0	.315	8.0	.394	10.0	.472	12.0	.630	16.0	.630	16.0	.787	20.0	.787	20.0
f1	.945	24.0	.945	24.0	1.280	32.5	1.496	38.0	1.693	43.0	1.929	49.0	2.480	63.0	2.874	73.0
f2 max	—	—	—	—	.177	4.5	.236	6.0	.236	6.0	.236	6.0	.236	6.0	.236	6.0
f3 max	1.260	32.0	1.260	32.0	1.811	46.0	2.087	53.0	2.283	58.0	2.598	66.0	3.150	80.0	3.543	90.0
f4	—	—	—	—	.551	14.0	.630	16.0	.787	20.0	.787	20.0	.945	24.0	.945	24.0
Kit No.	52491-07-1		52491-07-1		52491-01-1		52491-02-1		52491-03-1		52491-04-1		52491-05-1		52491-06-1	
-Z1 Kit No.	52491-07-3		52491-07-3		52491-01-3		52491-02-3		52491-03-3		52491-04-3		52491-05-3		52491-06-3	

ROD EYE MOUNTING WITH SPHERICAL BEARING KIT FOR METRIC ROD ENDS (CONTACT PHD FOR IMPERIAL STYLE) SIZES 20-100 mm (DIN 8139)



LETTER DIM/ TOLERANCE	BORE SIZE															
	20 mm		25 mm		32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in*	mm	in*	mm	in*	mm	in*	mm	in*	mm	in*	mm	in*	mm	in*	mm
AX min	.630	16.0	.787	20.0	.787	20.0	.866	22.0	1.102	28.0	1.102	28.0	1.299	33.0	1.299	33.0
CE	1.417	36.0	1.693	43.0	1.693	43.0	1.969	50.0	2.520	64.0	2.520	64.0	3.031	77.0	3.031	77.0
CN/H9	.315	8.0	.394	10.0	.394	10.0	.472	12.0	.630	16.0	.630	16.0	.787	20.0	.787	20.0
EN/h12	.472	12.0	.551	14.0	.551	14.0	.630	16.0	.827	21.0	.827	21.0	.984	25.0	.984	25.0
ER max	.472	12.0	.551	14.0	.551	14.0	.630	16.0	.827	21.0	.827	21.0	.984	25.0	.984	25.0
KK	—	M8 x 1.25	—	M10 x 1.25	—	M10 x 1.25	—	M12 x 1.25	—	M16 x 1.5	—	M16 x 1.5	—	M20 x 1.5	—	M20 x 1.5
LE min	.512	13.0	.591	15.0	.591	15.0	.669	17.0	.906	23.0	.906	23.0	1.063	27.0	1.063	27.0
Z°	—	4°	—	4°	—	4°	—	4°	—	4°	—	4°	—	4°	—	4°
Kit No.*	*	52493-05-1	*	52493-01-1	*	52493-01-1	*	52493-02-1	*	52493-03-1	*	52493-03-1	*	52493-04-1	*	52493-04-1

NOTES:

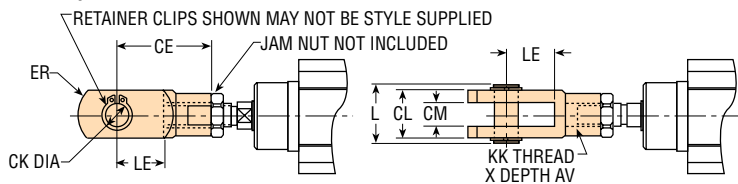
- 1) 32-100 mm sizes compatible with MSB2 rear fork for spherical bearing.
- 2) Not available in -Z1 or with imperial threads.
- 3) *Consult PHD for imperial rod eye mounting components and availability. Inch dimensions are given for metric conversion convenience only.

All dimensions are reference only unless specifically toleranced.

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MOUNTING ACCESSORIES: SERIES CV CYLINDERS

ROD CLEVIS MOUNTING KIT FOR METRIC ROD ENDS (CONTACT PHD FOR IMPERIAL STYLE) SIZES 20-100 mm (DIN 8140)

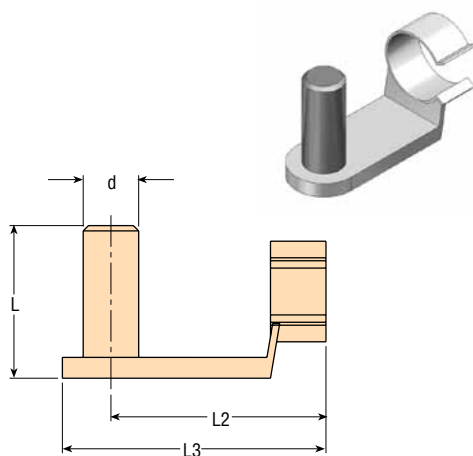


LETTER DIM/ TOLERANCE	BORE SIZE															
	20 mm		25 mm		32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in*	mm	in*	mm	in*	mm	in*	mm	in*	mm	in*	mm	in*	mm	in*	mm
AV min	0.630	16.0	0.787	20.0	.787	20.0	.866	22.0	1.102	28.0	1.102	28.0	1.299	33.0	1.299	33.0
CE	1.260	32.0	1.575	40.0	1.575	40.0	1.890	48.0	2.520	64.0	2.520	64.0	3.150	80.0	3.150	80.0
CK/H9	0.316	8.02	0.394	10.02	.394	10.0	.472	12.0	.630	16.0	.630	16.0	.787	20.0	.787	20.0
CL max	0.630	16.0	0.787	20.0	.787	20.0	.945	24.0	1.260	32.0	1.260	32.0	1.575	40.0	1.575	40.0
CM min	0.315	8.0	0.394	10.0	.394	10.0	.472	12.0	.630	16.0	.630	16.0	.787	20.0	.787	20.0
ER max	0.512	13.0	0.630	16.0	.630	16.0	.748	19.0	.984	25.0	.984	25.0	1.260	32.0	1.260	32.0
KK	—	M8 x 1.25	—	M10 x 1.25	—	M10 x 1.25	—	M12 x 1.25	—	M16 x 1.5	—	M16 x 1.5	—	M20 x 1.5	—	M20 x 1.5
L	0.827	21.0	0.984	25.0	.984	25.0	1.181	30.0	1.535	39.0	1.535	39.0	1.890	48.0	1.890	48.0
LE min	0.630	16.0	0.787	20.0	.787	20.0	.945	24.0	1.260	32.0	1.260	32.0	1.575	40.0	1.575	40.0
Metric Kit No.*	*	52492-05-1	*	52492-01-1	*	52492-01-1	*	52492-02-1	*	52492-03-1	*	52492-03-1	*	52492-04-1	*	52492-04-1
Metric -Z1 Kit No.*	*	52492-05-3	*	52492-01-3	*	52492-01-3	*	52492-02-3	*	52492-03-3	*	52492-03-3	*	52492-04-3	*	52492-04-3

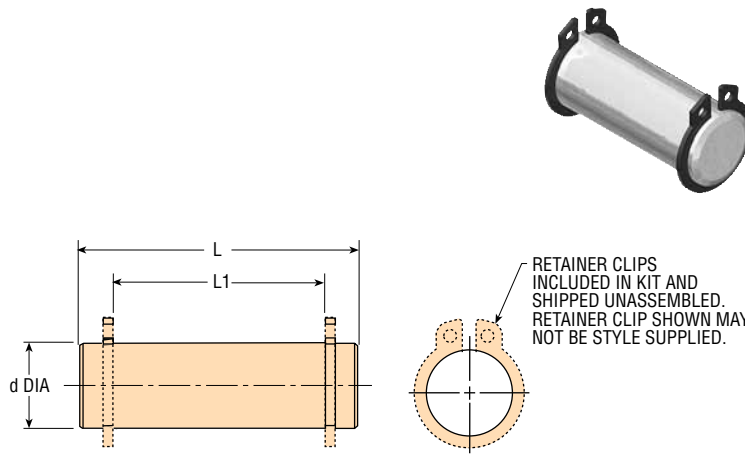
NOTES:

- 1) Kit includes clevis, pivot pin, and retainer rings (jam nut not included).
- 2) *Consult PHD for imperial rod eye mounting components and availability. Inch dimensions are given for metric conversion convenience only.

ROD CLEVIS PIVOT PIN KIT SIZES 20-100 mm



SIZE 20 mm



SIZES 25-100 mm (DIN 8140)

LETTER DIM	BORE SIZE															
	20 mm		25 mm		32 mm		40 mm		50 mm		63 mm		80 mm		100 mm	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
d	.315	8.0	.394	10.0	.394	10.0	.472	12.0	.630	16.0	.630	16.0	.787	20.0	.787	20.0
L	.827	21.0	.984	25.0	.984	25.0	1.181	30.0	1.535	39.0	1.535	39.0	1.890	48.0	1.890	48.0
L1	—	—	.791	20.1	.791	20.1	.949	24.1	1.264	32.1	1.264	32.1	1.579	40.1	1.579	40.1
L2	1.220	31.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—
L3	1.457	37.0	—	—	—	—	—	—	—	—	—	—	—	—	—	—
Kit No.	63463-05-1		63463-01-1		63463-01-1		63463-02-1		63463-03-1		63463-03-1		63463-04-1		63463-04-1	
-Z1 Kit No.	63463-05-3		63463-01-3		63463-01-3		63463-02-3		63463-03-3		63463-03-3		63463-04-3		63463-04-3	