

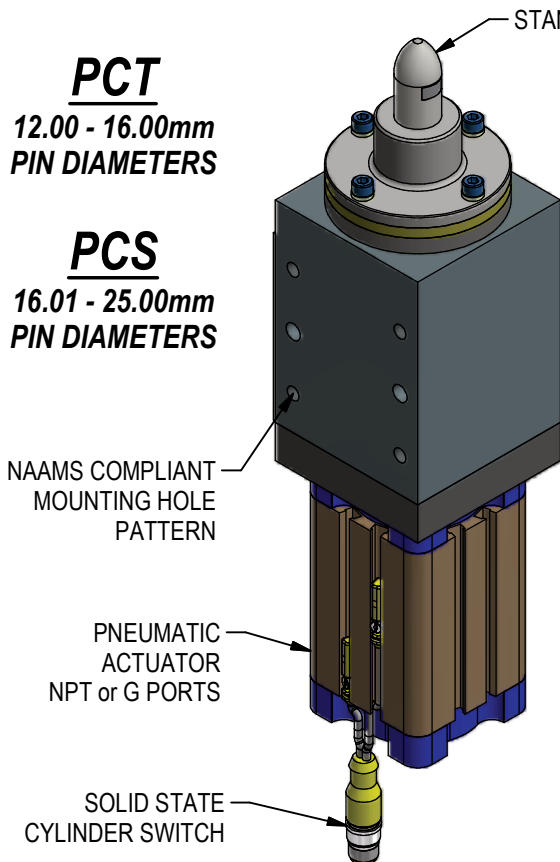
Patent #6,786,478

PIN CLAMPS FOR POSITIVE LOCATING AND CLAMPING

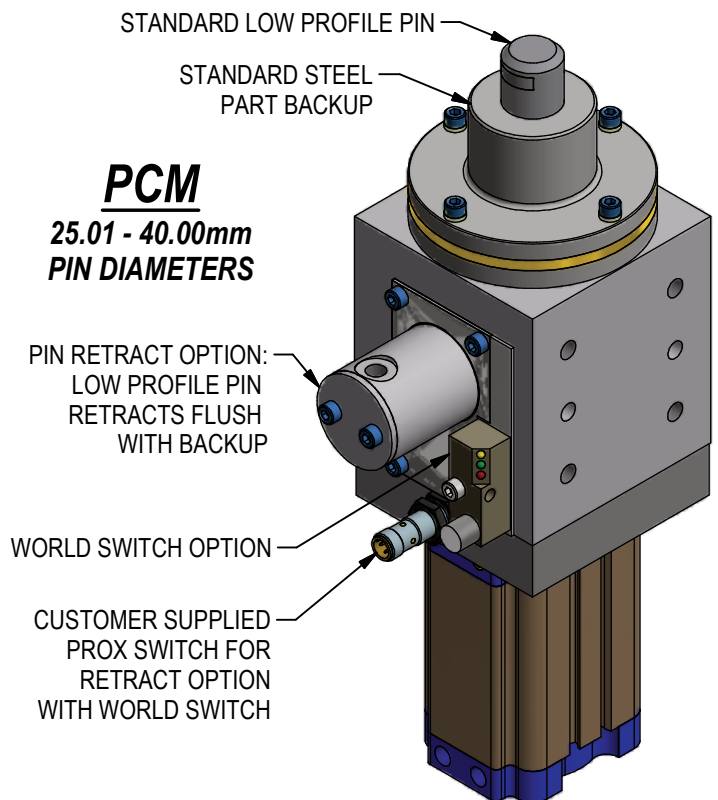
**REQUIRES NO
LUBRICATION!**

PCT
12.00 - 16.00mm
PIN DIAMETERS

PCS
16.01 - 25.00mm
PIN DIAMETERS

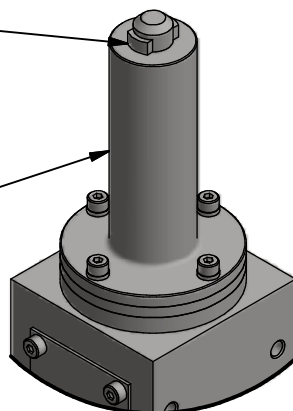


PCM
25.01 - 40.00mm
PIN DIAMETERS



GAPLESS CLAMP FINGER DESIGN AT FULL EXTENSION AND RETRACTION

OPTIONAL LONG PART BACKUP



APPLICATIONS

- ROBOT END EFFECTORS
- END OF ARM TOOLING
- AUTOMOTIVE ASSEMBLY & B/W
- PALLETIZED PART LOCATE & TRANSFER
- WELDING & HIGH CORROSIVE ENVIRONMENTS

RELEASED 8/7/17

ORDERING INFORMATION

NOTE: ALL BOXES MUST BE FILLED IN FOR A COMPLETE PART NUMBER



Series

- T PCT Body
- C PCS Body
- M PCM Body

Pin Diameter*

- 12.00-16.00 T Series
- 16.01-25.00 C Series
- 25.01-40.00 M Series

*Pin diameter to 2 decimal places

Pin Type

- A Bullet Nose Pin w/ fingers at 0°
- B Bullet Nose Pin w/ fingers at 90°
- C Bullet Nose 2-way Pin w/ fingers @ 0° **
- D Bullet Nose 2-way Pin w/ fingers @ 90° **
- E Low Profile Pin w/ fingers at 0°
- F Low Profile Pin w/ fingers at 90°
- G Low Profile 2-Way Pin w/ fingers @ 0° **
- H Low Profile 2-Way Pin w/ fingers @ 90° **

Actuator

See Actuator Charts

Switch Assembly Type

World Switch (See World Switch Chart)

- 0 None
- A DC Turck 4 Pin (PNP)
- B AC/DC Turck 5 Pin (N.O.)
- C DC Turck 4 Pin (NPN)
- D DC Pepprl-Fuchs 4 Pin (PNP)
- E DC Balluff 4 Pin (PNP/NO)
- J DC Efactor 4 Pin (PNP)

Cylinder Switch (See Cylinder Switch Chart)

- 0 None
- L Solid State Cylinder Switch

NOTE: Cylinder switches not available with actuator A on PCT

Switch ordering examples:

PCS with low profile pin, Turck World Switch in Retract position: C1601EBARA035KA

PCM with bullet nose pin, Welker L3 switch: M2501BBL3A051KA

STANDARD PRICING INCLUDES THESE FEATURES

** Not available on PCT with pin diameters 12.00 - 12.99mm

Options

- A Std Steel Backup
- B Steel Long Backup
- C Alum Bronze Backup
- D Alum Bronze Long Backup

Backup Distance

- K 14mm (for clamping range 0.1 - 4mm)
- N 17mm (for clamping range 4.1 - 7mm)

Backup Diameter

- 035-050 (Ø35-Ø50mm) C & T Series
- 051-075 (Ø51-Ø75mm) M Series

See Sheet 11 for smaller backup diameters

Port Type & Position

- A 1/8 NPT at Pos 1
- B 1/8 NPT at Pos 2
- C 1/8 NPT at Pos 3
- D 1/8 NPT at Pos 4
- J 1/8 G at Pos 1
- K 1/8 G at Pos 2
- L 1/8 G at Pos 3
- M 1/8 G at Pos 4

Switch Options

World Switch Sensor Position

- 0 None (No Switch)
- E Sensor 01-Unclamped (Pin Extended)
Sensor 02-Clamped
- R Sensor 01-Clamped (Pin Retracted)
Sensor 02-Unclamped

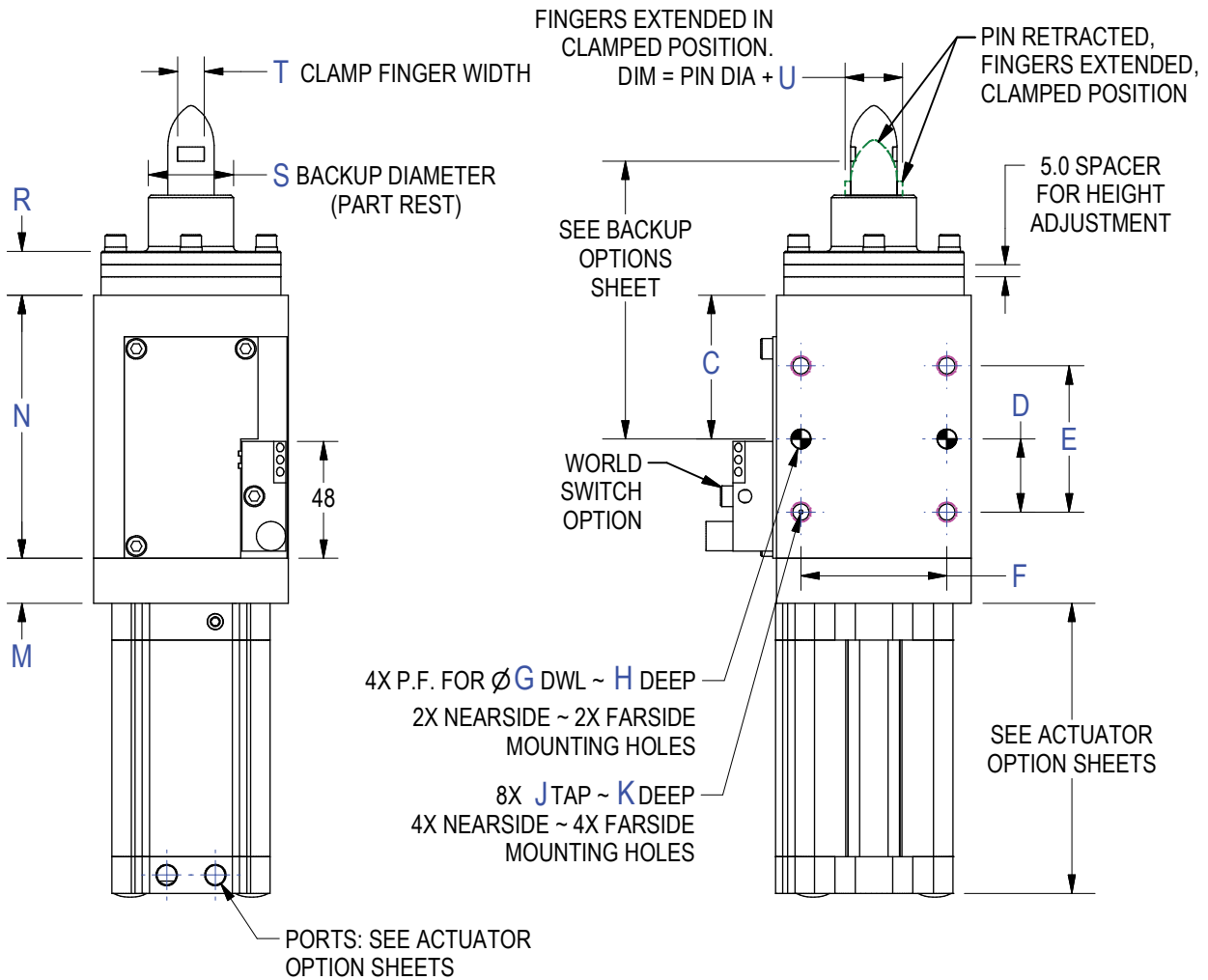
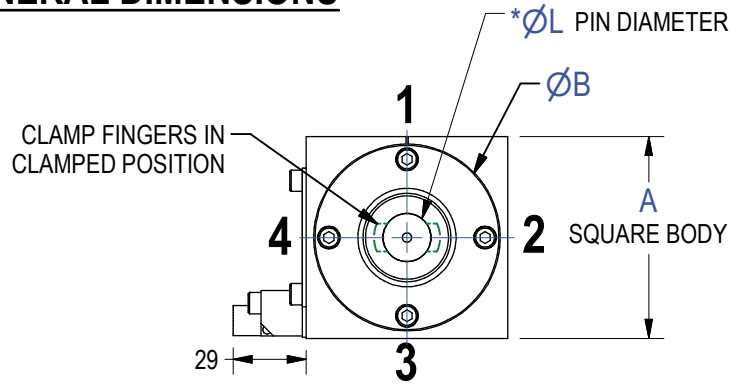
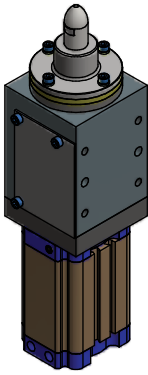
Cylinder Switch Selection

- 0 None (No Switch)
- 3 DC 4 Pin (PNP) Weld Field Immune
- 5 DC 3 Wire (NPN)

(DO NOT SCALE DRAWING)



GENERAL DIMENSIONS



SERIES	A	\varnothing B	C	D	E	F	G	H	J	K	* \varnothing L	M	N	R	\varnothing S	T	U	WGHT
T	80	74	59	30.00	60.00	60	8	16	M8 X 1.25	16	12.00-16.00	19	108	18	35-50	8	3.4	12 LBS
C	80	74	59	30.00	60.00	60	8	16	M8 X 1.25	16	16.01-25.00	19	108	18	35-50	11	4.6	12 LBS
M	100	99	55	30.00	60.00	60	8	16	M10 X 1.5	20	25.01-40.00	19	110	22	51-75	18	5.6	20 LBS

* DIAMETER RANGE FOR 2-WAY LOCATING PINS ARE DIFFERENT FROM 4-WAY RANGE. SEE SHEET 4

(DO NOT SCALE DRAWING)



LOCATING PIN OPTIONS

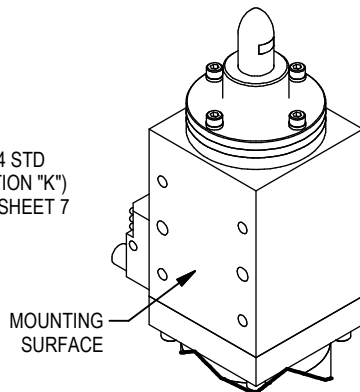
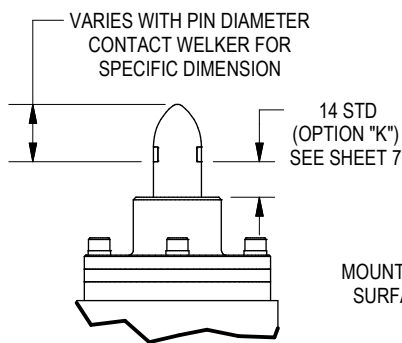
C **2500** **A** **B** **A** **R** **D** **035** **K** **A**

Pin Diameter
(Ø25.00mm SHOWN)
ORDER IN MILLIMETERS ONLY
.01 INCREMENTS

Pin Type	T SERIES DIAMETERS	C SERIES DIAMETERS	M SERIES DIAMETERS
A Bullet Nose Pin with fingers at 0°	12.00 - 16.00	16.01 - 25.00	25.01 - 40.00
B Bullet Nose Pin with fingers at 90°	12.00 - 16.00	16.01 - 25.00	25.01 - 40.00
C Bullet Nose 2-way Pin with fingers at 0°	13.00 - 16.00	18.00 - 26.00	26.85 - 42.00
D Bullet Nose 2-way Pin with fingers at 90°	13.00 - 16.00	18.00 - 26.00	26.85 - 42.00
E Low Profile Pin with fingers at 0°	12.00 - 16.00	16.01 - 25.00	25.01 - 40.00
F Low Profile Pin with fingers at 90°	12.00 - 16.00	16.01 - 25.00	25.01 - 40.00
G Low Profile 2-Way Pin with fingers at 0°	13.00 - 16.00	18.00 - 26.00	26.85 - 42.00
H Low Profile 2-Way Pin with fingers at 90°	13.00 - 16.00	18.00 - 26.00	26.85 - 42.00

STOCK 4-WAY DIAMETERS: 16.00, 19.85, 20.00, 24.85, 25.00, 34.85, 35.00, 39.85, 40.00

4-WAY PINS

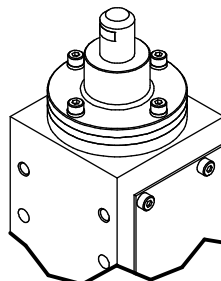
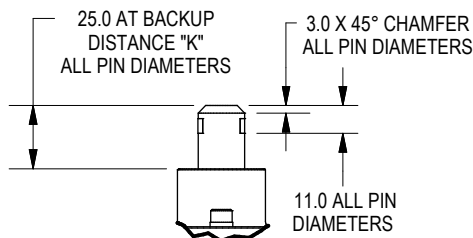


OPTION

A BULLET NOSE PIN WITH FINGERS AT 0°

B BULLET NOSE PIN WITH FINGERS AT 90°

PIN TYPE OPTION "A"
BULLET NOSE PIN WITH FINGERS
SHOWN AT 0° (FINGERS EXTEND &
RETRACT PARALLEL TO MOUNTING
SURFACE)



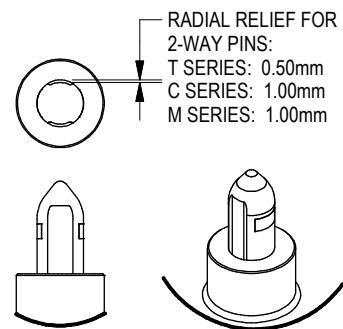
OPTION

E LOW PROFILE PIN WITH FINGERS AT 0°

F LOW PROFILE PIN WITH FINGERS AT 90°

PIN TYPE OPTION "F"
LOW PROFILE PIN WITH FINGERS
SHOWN AT 90° (FINGERS EXTEND &
RETRACT PERPENDICULAR TO
MOUNTING SURFACE)

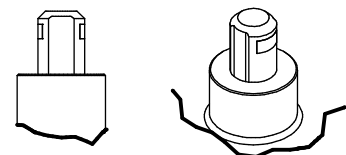
2-WAY PINS



OPTION

C BULLET NOSE 2-WAY PIN WITH FINGERS AT 0°

D BULLET NOSE 2-WAY PIN WITH FINGERS AT 90°



OPTION

G LOW PROFILE 2-WAY PIN WITH FINGERS AT 0°

H LOW PROFILE 2-WAY PIN WITH FINGERS AT 90°

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NOTE: FOR OPTIMAL HORIZONTAL APPLICATIONS,
ORIENTATION OF THE CLAMP FINGER MOVEMENT
SHOULD BE PARALLEL TO THE GROUND FOR ROUND
HOLES

ACTUATOR INFORMATION

	C	2	5	0	0	A	B	A	R	D	0	3	5	K	A
Series	Actuator					Port Type & Position									
T PCT Body															
C PCS Body															
M PCM Body															

NOTES: ALL ACTUATORS

AT LOSS OF AIR PRESSURE, SPRING ASSIST WILL MAINTAIN 50 LBS. OF CONSTANT CLAMP PRESSURE.

FOR INVERTED APPLICATIONS, PART WEIGHT MUST NOT EXCEED 50 LBS.

NORMAL OPERATING TEMPERATURE FOR ALL ACTUATORS IS -10° TO 165°F, -23 TO 74°C

PCT ACTUATOR INFORMATION

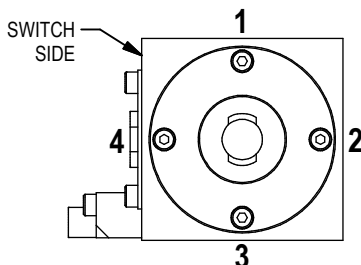
NOTE: Cylinder switches not available with actuator A on PCT

DESCRIPTION	PORTS	CLAMP FORCE (LBS.) (INCLUDES SPRING PRESSURE)	
		60 PSI	
A DOUBLE ACTING 40mm BORE	1/8" NPT or G 1/8	50	
B SINGLE ACTING 50mm BORE, SPRING CLAMP		50	
T SINGLE ACTING 50mm BORE, SPRING CLAMP, RETRACTABLE PIN		50	

PCS & PCM ACTUATOR INFORMATION

DESCRIPTION	PORTS	CLAMP FORCE (LBS.) 50mm BORE ACTUATOR INCLUDES SPRING PRESSURE		
		60 PSI	80 PSI	100 PSI
B DOUBLE ACTING 50mm BORE WITH SPRING ASSIST	1/8" NPT or G 1/8	220	277	333
T DOUBLE ACTING 50mm BORE, SPRING ASSIST, RETRACTABLE PIN		220	277	333

TOP VIEW: PORT LOCATION



PORT TYPE & POSITION

A NPT AT POSITION #1	J G AT POSITION #1
B NPT AT POSITION #2	K G AT POSITION #2
C NPT AT POSITION #3	L G AT POSITION #3
D NPT AT POSITION #4	M G AT POSITION #4

(DO NOT SCALE DRAWING)

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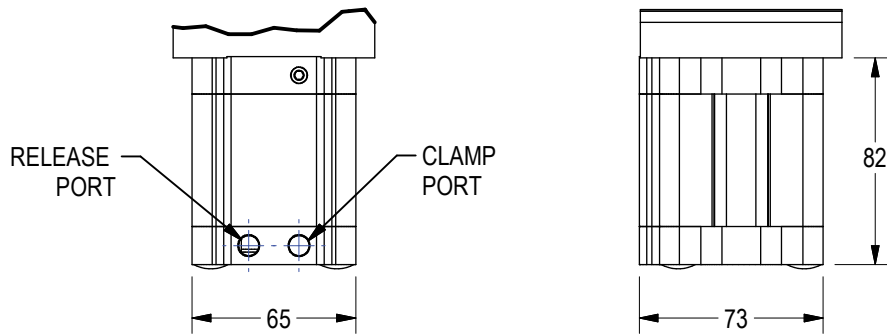
ACTUATOR DIMENSIONS: A & B

ACTUATOR T ON FOLLOWING SHEET

ACTUATOR A

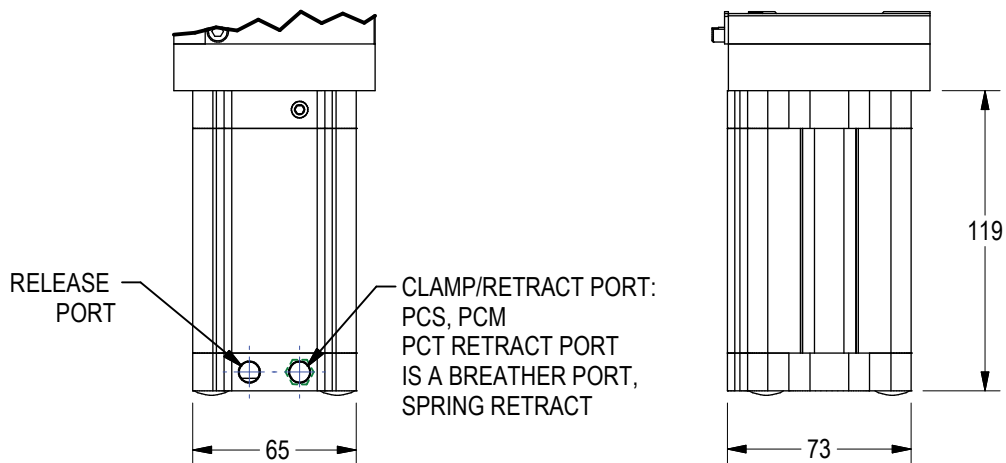
40mm BORE

NOTE: Cylinder switches not available with actuator A on PCT



ACTUATOR B

50mm BORE

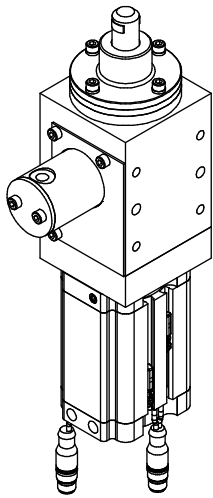


(DO NOT SCALE DRAWING)

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ACTUATOR T: RETRACT OPTION

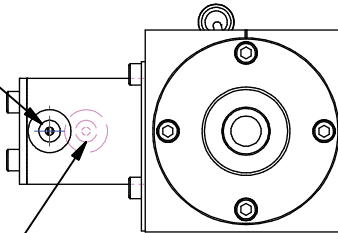
FOR RETRACT SEQUENCE SEE SHEET 8



SHOWN WITH
CYLINDER SWITCH
OPTION

EXTEND PORT
1/8" NPT or G1/8

RETRACT PORT
1/8" NPT or G1/8



MUST USE LOW PROFILE PIN
OPTIONS E-H FOR PIN TO
RETRACT FLUSH TO BACKUP

Ø42

SECONDARY
CYLINDER

PRIMARY CYLINDER
1/8" NPT OR G1/8

65

55

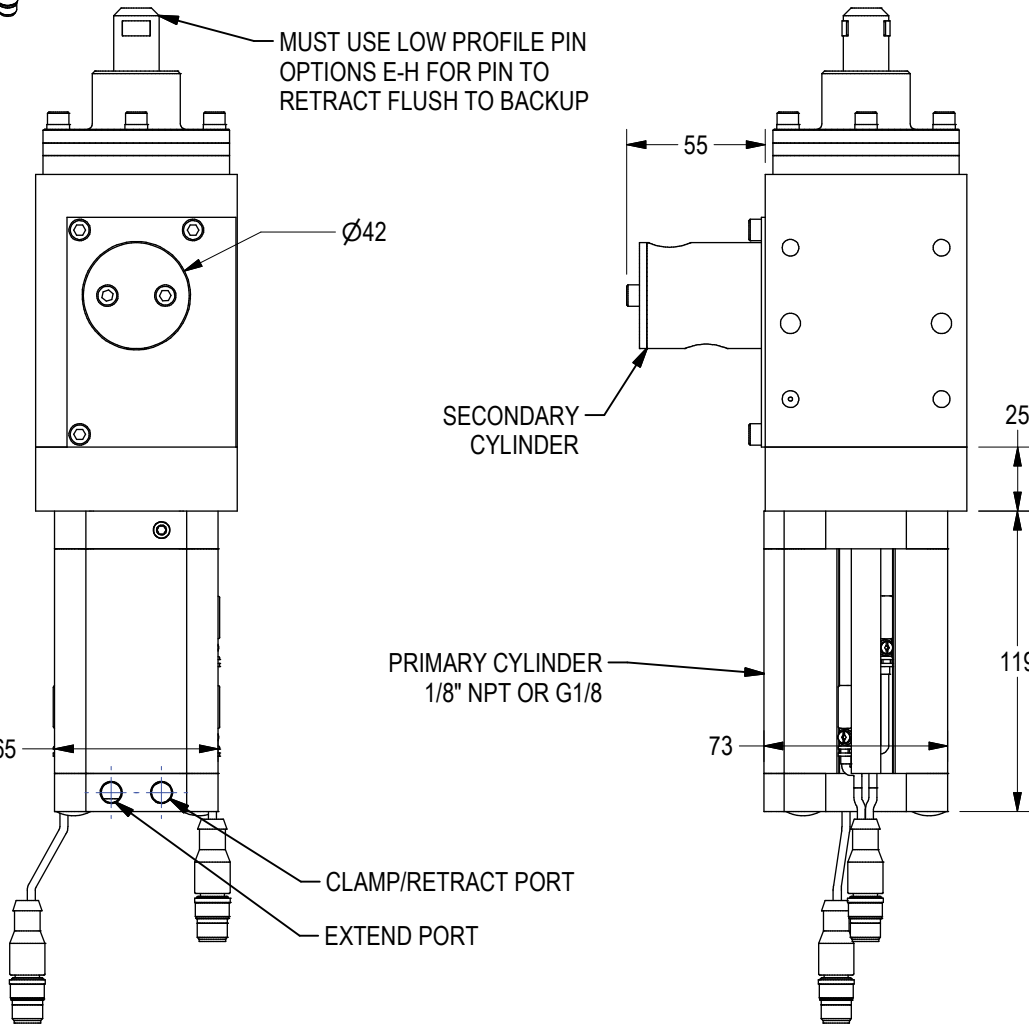
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119

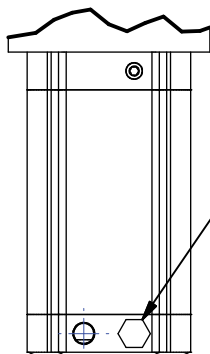
73

CLAMP/RETRACT PORT

EXTEND PORT



CLAMP/RETRACT PORT:
PCS, PCM
PCT RETRACT PORT
IS A BREATHER PORT,
SPRING RETRACT

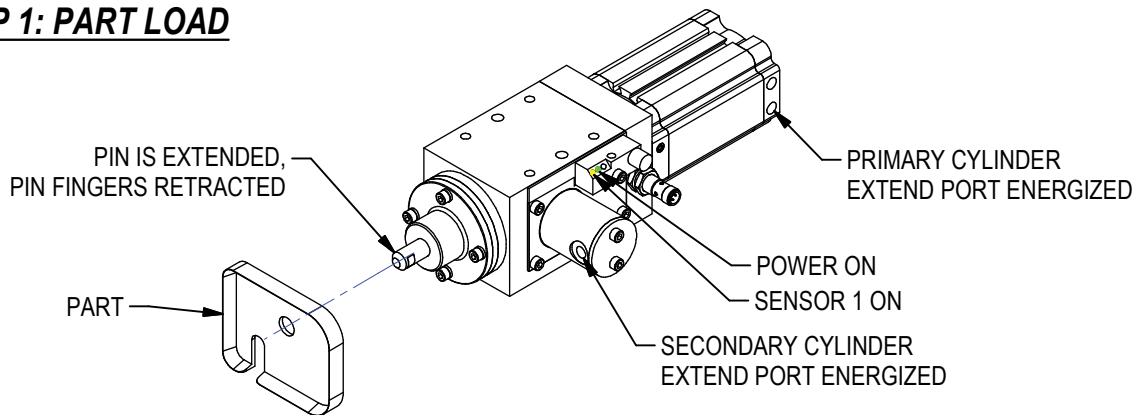


(DO NOT SCALE DRAWING)

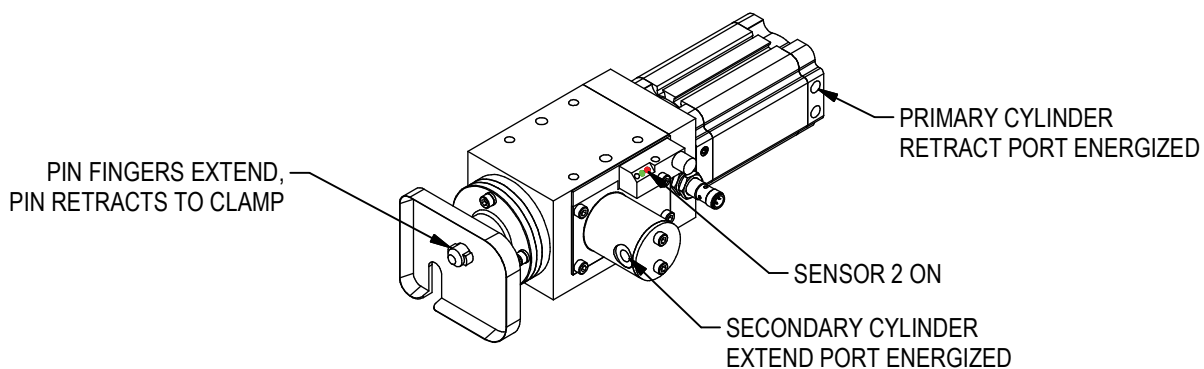
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PIN CLAMP RETRACT OPTION SEQUENCE

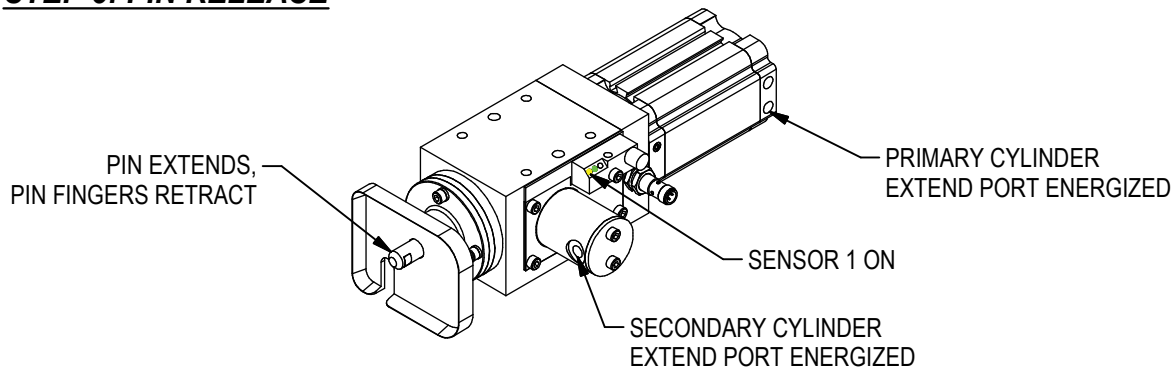
STEP 1: PART LOAD



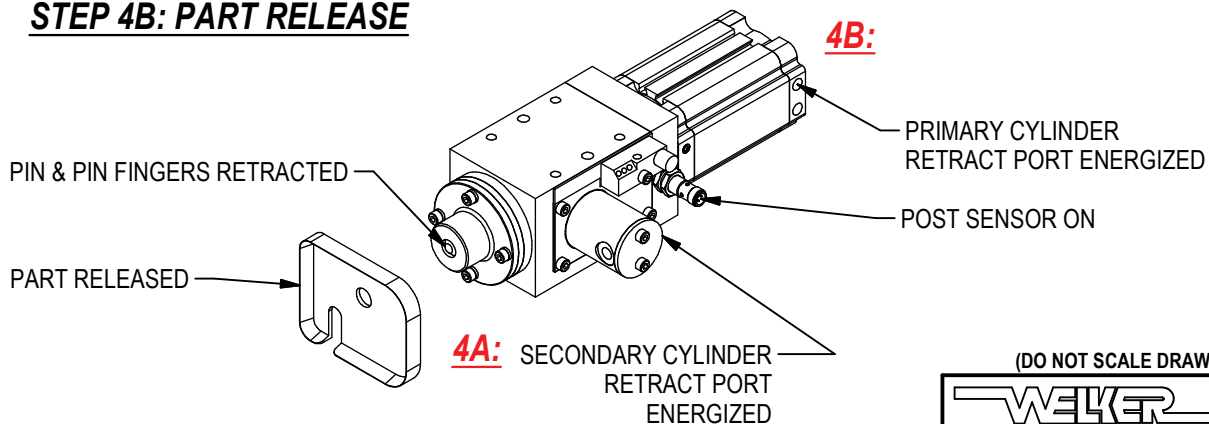
STEP 2: PART CLAMP



STEP 3: PIN RELEASE



STEP 4A: PIN RETRACT STEP 4B: PART RELEASE



WORLD SWITCH INFORMATION

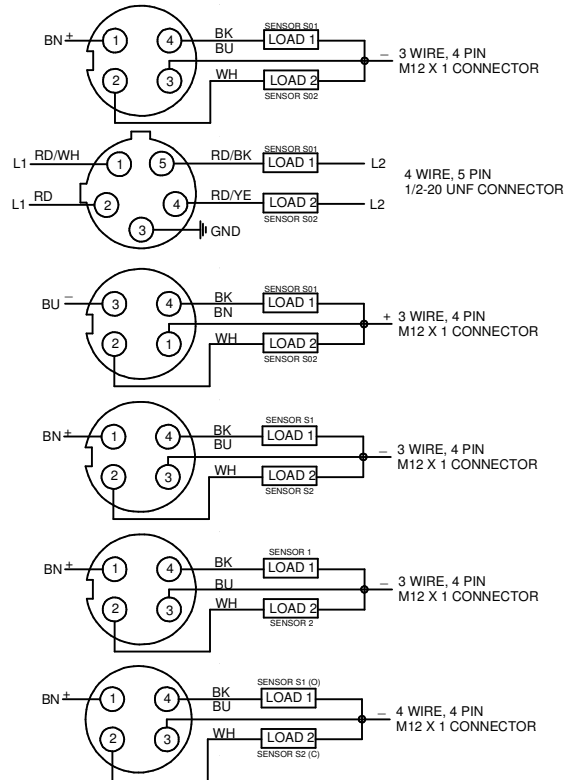
C
2
5
0
0
A
B
A
E
D
0
3
5
K
A

WORLD SWITCH ASSEMBLY

WORLD SWITCH SENSOR POSITION

WORLD SWITCH ASSEMBLY

- 0
NONE
- A
DC TURCK 4-PIN (PNP)
#Ni2-Q6.5-AP6-0.1-FS 4.4x3/S304
- B
AC/DC TURCK 5-PIN (N.O.)
#Ni2-Q6.5-ADZ32-0.1-FSB 5.4x4/S304
- C
DC TURCK 4-PIN (NPN)
#Ni2-Q6.5-AN6-0.1-FS 4.4x3/S304
- D
*DC PEPPRL & FUCHS 4-PIN (PNP)
#NBN2-F581-100S6-E8-V1
- E
DC BALLUFF 4-PIN (PNP)
#BES-Z02KR2-PSC20F-P100-S04
- J
DC EFECTOR 4-PIN (PNP)
#IN 5374



*STANDARD SWITCH PRICING
OTHER SWITCHES MAY REQUIRE PRICING PREMIUM

SENSOR POSITION

- 0
NONE
- E
Sensor 01-Unclamped (Pin Extended, Load/Unload Position)
Sensor 02-Clamped (Pin Retracted)
- R
Sensor 01-Clamped (Pin Retracted)
Sensor 02-Unclamped (Load/Unload Position)

Note: Sensor 01 displays an amber LED. Sensor 02 displays a red LED

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CYLINDER SWITCH INFORMATION

C
2
5
0
0
A
B
L
3
D
0
3
5
K
A

CYLINDER SWITCH

FOR PIN CLAMP ACTUATOR OPTION "B" & "D"
 (NOTE: Cylinder switches not available with actuator A on PCT)

Option	QTY	Switch Part #	Wire	Output	Mfg
L3	1	SWITCH L3** Dual sensor, single connector switch: 1 switch required per cylinder	4	PNP	Welker
L5	2	MK5113 Single sensor, single connector switch: 2 switches required per cylinder	3	NPN	ifm Efeotor

FOR PIN CLAMP ACTUATOR OPTION "T"

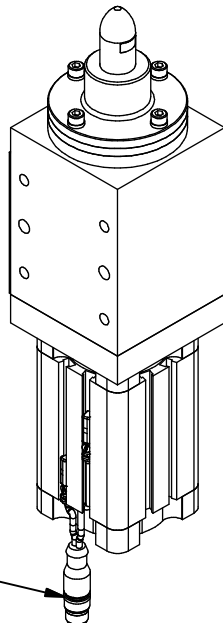
Option	QTY	Switch Part #	Wire	Output	Mfg
L3	1	SWITCH L3**	4	PNP	Welker
	1	SWITCH L3S** Single sensor, single connector switch: 1 switch required for retract cylinder	3	PNP	
L5	3	MK5113	3	NPN	ifm Efeotor

**L3 switch is weld field immune, comparable to World Switches

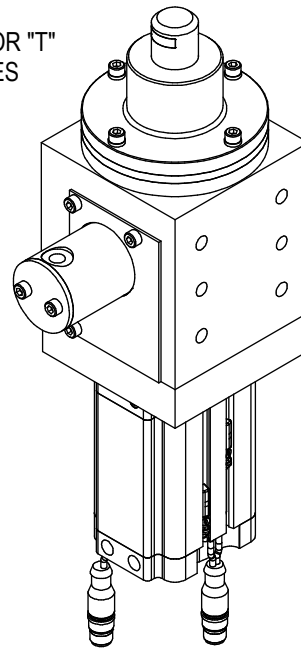
Standard Switch Option - All other options may affect price and delivery

All switches are DC M12 X 1, Quick Disconnect

PCS WITH ACTUATOR "B"
AND L3 SWITCH



PCM WITH ACTUATOR "T"
AND L3 SWITCHES



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BACKUP OPTIONS

C **2500** **A** **B** **A** **R** **D** **035** **K** **A**

BACKUP DIAMETER RANGE
(1mm INCREMENTS)

MIN **035** TO MAX **050** "C" & "T" SERIES
051 TO **075** "M" SERIES

Backup Distance

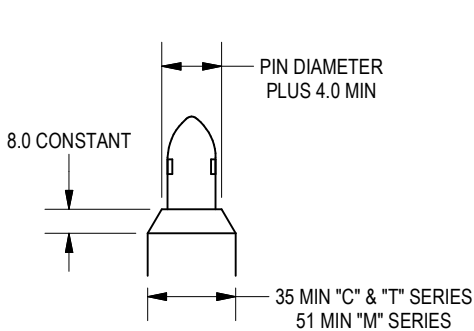
OPTION "K": 14mm (for Clamping Range: 0.1 - 4mm)
OPTION "N": 17mm (for Clamping Range: 4.1 - 7mm)

OPTIONS

- A** STANDARD STEEL BACKUP
- B** STEEL LONG BACKUP
- C** ALUMINUM BRONZE BACKUP
- D** ALUMINUM BRONZE LONG BACKUP

NOTE: LOCATING PIN RETRACTS TO ACTUATE CLAMP FINGERS. CLAMP FINGERS ARE EXTENDING DURING THE FIRST 10mm OF PIN TRAVEL AND THEN TRAVELS LINEARLY UNTIL CLAMPED.

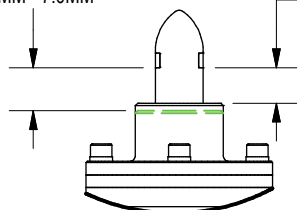
FOR SPECIAL PART CLAMP RANGES, CONTACT WELKER



BACKUP DIMENSIONS FOR DIAMETERS LESS THAN THE MINIMUM SHOWN

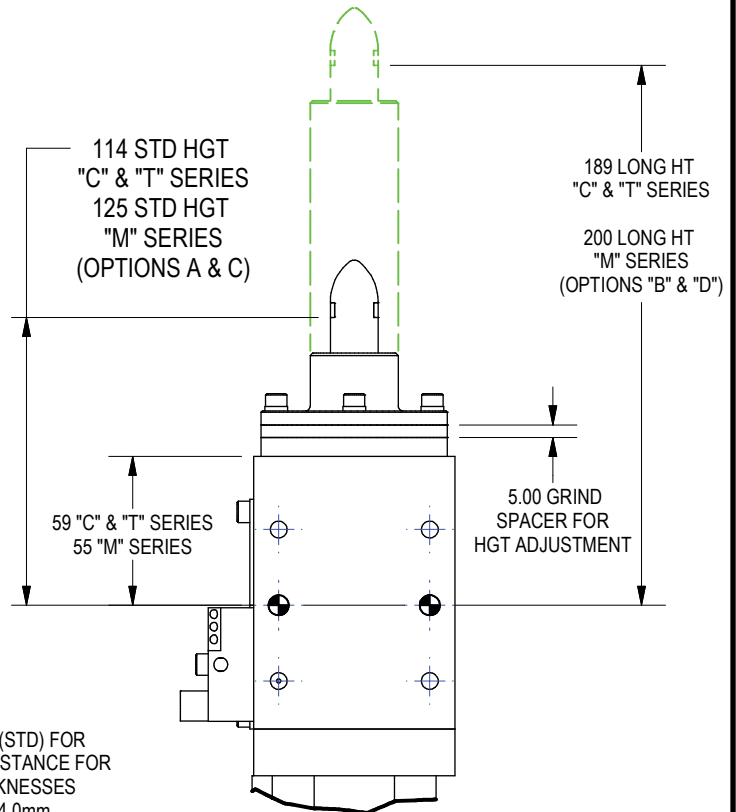
EXAMPLE: TO ORDER A "C" SERIES WITH $\phi 18.85$ PIN AND A $\phi 25.0$ BACKUP TOUCHING THE PART, USING THE ABOVE ORDER NUMBER, ORDER #C1885AAARD025KA

OPTION "N" (STD) FOR 17.0 BACKUP DISTANCE FOR PART THICKNESSES 4.0MM - 7.0MM



STANDARD BACKUP DISTANCES

OPTION "K" (STD) FOR 14.0 BACKUP DISTANCE FOR PART THICKNESSES 0.1mm - 4.0mm



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PIN CLAMP DESIGN GUIDELINES

1. FOR HORIZONTAL APPLICATIONS, ORIENTATION OF THE CLAMP FINGER MOVEMENT SHOULD BE PARALLEL TO THE GROUND FOR ROUND HOLES. SEE GENERAL DIMENSION SHEET FOR MAXIMUM SIDE LOADS.
2. PROXIMITY OF SOME WELD APPLICATIONS TO THE PIN CLAMP COULD AFFECT THE LIFE OF THE PIN AND CLAMP FINGERS.
3. IMPACT LOADING AND EXCESSIVE SIDE LOADING MUST BE AVOIDED. FOR ROBOTICS AND HARD AUTOMATION APPLICATIONS, THE LOCATING PINS NEED TO ENGAGE AND DISENGAGE AT LOAD AND UNLOAD.
4. WELKER ENGINEERED PRODUCTS DOES NOT RECOMMEND MORE THAN ONE 4-WAY AND ONE 2-WAY LOCATING DEVICE IN A COMMON GEO SETTING APPLICATION. PIN BIND AND EXCESSIVE SIDE LOAD MAY RESULT. IF A GEO SETTING APPLICATION REQUIRES MULTIPLE LOCATING DEVICES, CONTACT WELKER.
5. ALL PIN CLAMPS ARE DESIGNED TO BE OPERABLE UP TO 110 psi MAX.
6. PIN CLAMP PNEUMATIC ACTUATORS HAVE INTEGRATED FLOW RESTRICTIVE ORIFICES. FLOW CONTROLS ARE NOT REQUIRED.

WARRANTY

WELKER ENGINEERED PRODUCTS WARRANTS TO ITS CUSTOMERS PURCHASING PIN CLAMPS MANUFACTURED BY WELKER THAT THESE UNITS ARE FREE FROM DEFECTS IN WORKMANSHIP AND MATERIALS. WELKER WARRANTS IT WILL REPAIR DEFECTS IN ITS MANUFACTURE DETERMINED BY WELKER TO HAVE OCCURRED AS A RESULT OF DEFECTIVE WORKMANSHIP AND /OR MATERIALS. THIS WARRANTY AUTOMATICALLY EXPIRES AT THE EARLIER OF THREE YEARS FROM THE DATE OF WELKER BEARING'S SHIPMENT OF THE PRODUCTS TO ITS CUSTOMER, OR THREE MILLION CYCLES. THE AFOREMENTIONED WARRANTY SHALL NOT APPLY IF WELKER DETERMINES THE PIN CLAMP(S) WERE MISAPPLIED, ABUSED, OR MODIFIED BY THE CUSTOMER. WITH THE EXCEPTION OF THE THREE YEAR OR THREE MILLION CYCLE WARRANTY ON DEFECTIVE WORKMANSHIP AND MATERIALS, WELKER BEARING MAKES NO EXPRESS WARRANTY, NO WARRANTY OF MERCHANTABILITY, NO WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE AND NO WARRANTY WHICH EXTENDS BEYOND THIS WRITING ON WELKER MANUFACTURED PIN CLAMPS SOLD BY WELKER BEARING.

LOCATING PINS AND CLAMP FINGERS ARE CONSIDERED WEAR ITEMS AND AS SUCH ARE NOT INCLUDED IN THIS WARRANTY UNLESS THERE IS A MANUFACTURING DEFECT AS STATED ABOVE.

UNDER NO CIRCUMSTANCES SHALL WELKER BEARING BE LIABLE TO ANYONE FOR INCIDENTAL, CONSEQUENTIAL, EXEMPLARY, SPECIAL OR PUNITIVE DAMAGES WHETHER DIRECT OR INDIRECT, INCLUDING, BUT NOT LIMITED TO DOWN TIME, ARISING OUT OF OR RELATED TO ANY PRODUCTS SOLD OR MANUFACTURED BY WELKER ENGINEERED PRODUCTS.

ANY PRODUCT THOUGHT TO BE DEFECTIVE IN WORKMANSHIP OR MATERIALS MUST BE RETURNED TO WELKER FREIGHT PREPAID FOR EVALUATION. WELKER SHALL NOT BE LIABLE FOR LABOR COST INCURRED IN THE REMOVAL OF A PART, DEFECTIVE PART OR THE INSTALLATION OF ANY REPLACEMENT PART.

ALL PNEUMATIC PIN CLAMPS ARE SHIPPED WITH INTERNAL OR EXTERNAL FLOW RESTRICTORS. IF THESE RESTRICTORS ARE REMOVED OR BYPASSED, THE WARRANTY IS VOID.

(DO NOT SCALE DRAWING)

