

phd INFORMATION SHEET: SERIES GRS DESIGN 2 [6] GRIPPERS

IMPORTANT INFORMATION DO NOT DISCARD!

Use this information sheet to assist with gripper installation and setup.
File with maintenance or machine documentation.

WARNING: Units with -FSE2 and -FSR2 options contain compressed springs. For complete disassembly procedures, see instruction sheet 6441-728.

AVISO: Las unidades con opciones -FSE2 y -FSR2 contienen muelles comprimidos. Véase procedimiento de desmontaje en la hoja de instrucciones 6441-728.

ATTENTION: Les modèles avec options -FSE2 et -FSR2 contiennent des ressorts comprimés. Se reporter à la feuille d'instruction 6441-728 pour la procédure de désassemblage complète.

ACHTUNG: Einheiten mit der Option -FSE2 und -FSR2 sind mit komprimierten Federn ausgestattet. Zur Demontage bitte Anweisungsblatt 6441-728 beachten!

NOTES:

- * 1) Design number indicates imperial or metric mountings, dowel pin holes, and ports.
- 2) Standard unit includes magnet for Series JC1 Switches
- ** 3) Inductive Proximity Switch Bundle adds -CP option, target and switch mounting brackets. Quantity of 1 includes 1 bracket, quantity of 2 includes 2 brackets.
- 4) Switch bundles available with gripper only.

TO ORDER SPECIFY:
Product, Grip, Jaw Style, Design No., Size, Total Jaw Travel, and Options required.

GRIP
High Force

DESIGN NO.*
2 - Imperial
6 - Metric

SWITCH BUNDLE OPTION CODE
(see Notes 3-4)
Sxxxx

SWITCH SERIES
C - Series JC1SDx-x, Single Position
E - Series JC1STP-x, Teachable (PNP only)
P - Inductive Proximity Switch

QUANTITY
1 or 2** Inductive Proximity Switches or Mounting Brackets
1 to 9 JC1SDx-x, JC1DTP-x

SWITCH CIRCUITRY
0 - Mounting Hardware Only (No Switches)
N - NPN (Sink)
P - PNP (Source)

CABLE TYPE
0 - No Switches
K - Quick Connect Only (JC1SDx-K, JC1STP-K)
2 - 2 Meter Length Cable (Prox, JC1STP-2)
5 - 5 Meter Length Cable (JC1SDx-5)

PRODUCT
Compact, highly configurable, parallel gripper with side mounting jaws

JAW STYLE
(See Below)
1 - Top Wide
3 - Side
4 - Top Narrow

GRS 3 3 - 2 - 27 x 4.5 - FSR2 - Sxxxx

SIZE	JAW STYLE	BORE SIZE		MINIMUM TOTAL JAW TRAVEL	
		Diameter mm	in	Total Travel Per Bore Size mm	in
19	1	19	0.748	4.5	0.177
25	4	25	0.984	6.5	0.256
25	3	25	0.984	7	0.276
27	3	27	1.063	4.5	0.177
27	3	27	1.063	7	0.276
28	3	27	1.063	6	0.250
28	3	27	1.063	10	0.394
32	3	32	1.260	8	0.315
32	3	32	1.260	13	0.512
40	3	40	1.575	13	0.512
40	3	40	1.575	19	0.748
50	3	50	1.969	19	0.750
50	3	50	1.969	28	1.102
63	3	63	2.480	32	1.260
63	3	63	2.480	44	1.732

TOTAL JAW TRAVEL = OPEN POSITION - CLOSED POSITION

OPTIONS (OMIT IF NOT REQUIRED)

MANIFOLD & PORT OPTIONS
L11-UB99 - Manifold in location 99
L11-UB37 - Manifold in location 37 (includes GR3 option)
LT37 - Purge port in location 37
UB48 - Port in location 48

SENSOR OPTION
CP - Inductive Proximity Switch Ready

MOUNTING OPTION
GR3 - Mounting in location 37

SPRING ASSIST (JAW STYLE 3 UNITS ONLY)
FSR2 - Spring assist close
FSE2 - Spring assist open

FLUID COMPATIBILITY & LUBRICATION
V1 - Fluoroelastomer seals and lubricants
Y4 - Cleanroom grade lubricant
V6 - Fluoroelastomer seals and Cleanroom grade lubricant

6 mm SQUARE INDUCTIVE PROXIMITY SWITCHES (SIZE 19)

PART NO.	DESCRIPTION
18431-001-02	NPN (Sink), 10-30 VDC, 2 m cable
18431-002-02	PNP (Source), 10-30 VDC, 2 m cable

4 mm ROUND INDUCTIVE PROXIMITY SWITCHES (SIZE 25, 27, 28, 32, 40)

PART NO.	DESCRIPTION
18430-001-02	NPN (Sink), 10-30 VDC, 2 m cable
18430-002-02	PNP (Source), 10-30 VDC, 2 m cable

8 mm THREADED INDUCTIVE PROXIMITY SWITCHES (SIZE 50, 63)

PART NO.	DESCRIPTION
51422-005-02	NPN (Sink) 2 m cable
51422-006-02	PNP (Source) 2 m cable

SERIES JC1SDx SINGLE POSITION SWITCHES

PART NO.	DESCRIPTION
JC1SDN-5	NPN (Sink) Solid State, 10-30 VDC, 5 m cable
JC1SDP-5	PNP (Source) Solid State, 10-30 VDC, 5 m cable
JC1SDN-K	NPN (Sink) Solid State, 10-30 VDC, Quick Connect
JC1SDP-K	PNP (Source) Solid State, 10-30 VDC, Quick Connect

Includes one switch and installation instructions.

SERIES JC1SDx CORDSET

PART NO.	DESCRIPTION
63549-02	M8, 3 pin, Straight Female Connector, 2 m cable
63549-05	M8, 3 pin, Straight Female Connector, 5 m cable

Includes one cordset.

SERIES JC1ST TWO POSITION TEACHABLE MAGNETIC SWITCHES

PART NO.	DESCRIPTION
JC1STP-2	PNP (Source), Solid State, 12-30 VDC, 2 m cable
JC1STP-K	PNP (Source), Solid State, 12-30 VDC, Quick Connect

Includes one switch and installation instructions.

SERIES JC1ST CORDSET

PART NO.	DESCRIPTION
81284-1-001	M8, 4 pin, Straight Female Connector, 5 m cable

Includes one cordset.

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phd[®] START-UP & MOUNTING INFORMATION: SERIES GRS DESIGN 2 [6] GRIPPERS

RECOMMENDATIONS

Design tooling so that the grip point is as close to the gripper surfaces as possible. The grip force factor (Gf) values are for zero tooling length. As the grip point is moved away from the jaw surface, the applied moment causes jaw friction to increase, resulting in reduced effective grip force.

The maximum load that grippers can handle will vary based on: size of the part being picked up, shape of the part, texture of the part, speed at which the part is transferred, working pressure, shape of the fingers, etc.

A synchronized unit is not recommended for use as a force multiplier for a single jaw.

START UP PROCEDURES

The gripper should be securely mounted with all tooling and external flow control devices attached prior to applying pressure to the unit. Care should be taken to provide adequate clearance for the jaws to open and close. At initial start-up, apply pressure slowly to the unit.

SEALS AND FLUIDS

Long life seals are standard on all Series GRS Grippers. These seals are compatible with standard paraffin-based lubrication oils used for pneumatic cylinders. For compatibility with other fluids, consult PHD.

DISASSEMBLY AND REPAIR

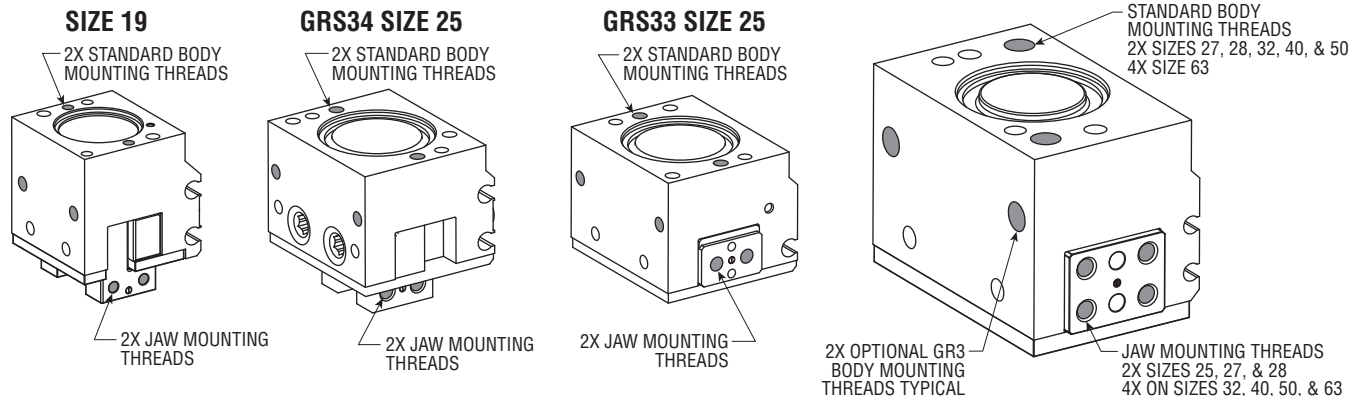
The GRS Series Design 2 [6] grippers are field repairable, to replace seals see GRS repair sheet 6441-728 for directions and kit numbers.

MAXIMUM RECOMMENDED MOUNTING TORQUES

MODEL NUMBER	STANDARD BODY MOUNTING THREADS			JAW MOUNTING THREADS			OPTIONAL GR3 BODY MOUNTING THREADS		
	THREAD	in-lb	Nm	THREAD	in-lb	Nm	THREAD	in-lb	Nm
GRS31-2-19x4.5	4-40 x 0.375 DP	12	1.4	6-32 x 0.249 THRU	22	2.5	8-32 x 0.315 DP	40	4.5
GRS34-2-25x6.5	6-32 x 0.382 DP	22	2.5	6-32 x 0.249 THRU	22	2.5	8-32 x 0.374 DP	40	4.5
GRS33-2-25x7	6-32 x 0.382 DP	22	2.5	6-32 x 0.197 DP	22	2.5	6-32 x 0.384 DP	22	2.5
GRS33-2-27x4.5 or 7	8-32 x 0.276 DP	40	4.5	8-32 x 0.236 DP	40	4.5	8-32 x 0.315 DP	40	4.5
GRS33-2-28x6 or 10	1/4-20 x 0.354 DP	150	17	10-32 x 0.315 DP	65	7.3	1/4-20 x 0.512 DP	150	17
GRS33-2-32x8 or 13	5/16-18 x 0.591 DP	300	34	10-32 x 0.394 DP	65	7.3	5/16-18 x 0.591 DP	300	34
GRS33-2-40x13 or 19	5/16-18 x 0.591 DP	300	34	1/4-28 x 0.472 DP	180	20	5/16-18 x 0.591 DP	300	34
GRS33-2-50x19 or 28	3/8-16 x 0.768 DP	500	56	1/4-28 x 0.512 DP	180	20	3/8-16 x 0.630 DP	500	56
GRS33-2-63x32 or 44	1/2-13 x 1.024 DP	600	68	3/8-24 x 0.768 DP	600	68	1/2-13 x 1.024 DP	600	68
GRS31-6-19x4.5	M3 x 0.5 x 9.5 DP	12	1.4	M3 x 0.5 x 6.32 THRU	22	2.5	M4 x 0.7 x 8 DP	22	2.5
GRS34-6-25x6.5	M4 x 0.7 x 9.4 DP	22	2.5	M4 x 0.7 x 6.32 THRU	22	2.5	M4 x 0.7 x 9.5 DP	22	2.5
GRS33-6-25x7	M4 x 0.7 x 9.7 DP	22	2.5	M4 x 0.7 x 6 DP	30	3.4	M4 x 0.7 x 9.8 DP	22	2.5
GRS33-6-27x4.5 or 7	M5 x 0.8 x 7.0 DP	60	6.8	M4 x 0.7 x 6 DP	30	3.4	M5 x 0.8 x 8 DP	60	6.8
GRS33-6-28x6 or 10	M6 x 1.0 x 9.0 DP	100	11	M5 x 0.8 x 8 DP	65	7.3	M6 x 1.0 x 13 DP	100	11
GRS33-6-32x8 or 13	M8 x 1.25 x 15 DP	250	28	M5 x 0.8 x 10 DP	65	7.3	M8 x 1.25 x 15 DP	250	28
GRS33-6-40x13 or 19	M8 x 1.25 x 15 DP	250	28	M6 x 1.0 x 12 DP	100	11	M8 x 1.25 x 15 DP	250	28
GRS33-6-50x19 or 28	M10 x 1.5 x 19.5 DP	500	56	M6 x 1.0 x 13 DP	100	11	M10 x 1.5 x 16 DP	500	56
GRS33-6-63x32 or 44	M12 x 1.75 x 26 DP	600	68	M10 x 1.5 x 19.5 DP	500	56	M12 x 1.75 x 26 DP	600	68

NOTES:

- 1) ASSUMES USE OF AT LEAST 75% OF FULL THREADED DEPTH.
- 2) ASSUMES USE OF HIGH STRENGTH STEEL SOCKET HEAD CAP SCREWS.
- 3) PHD RECOMMENDS THE USE OF THREADLOCKER ON MOUNTING THREADS.

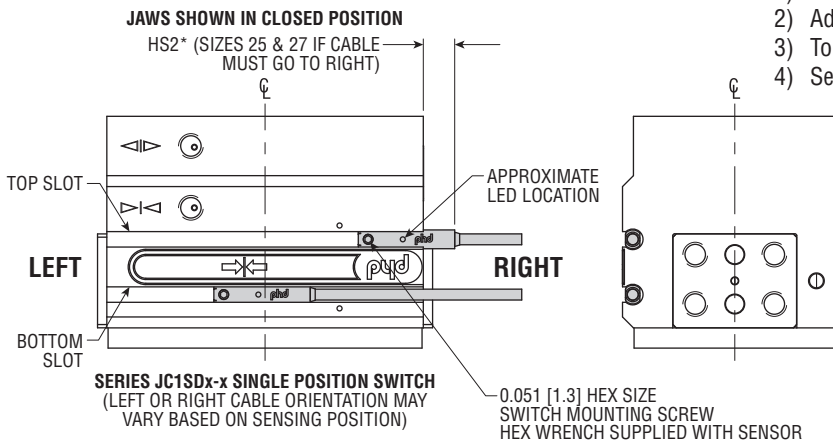


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phd SWITCH MOUNTING INFORMATION: SERIES GRS DESIGN 2 [6] GRIPPERS

SERIES JC1SDx-x SINGLE POSITION SWITCH



INSTALLING AND ADJUSTING SERIES JC1SDx-x SWITCHES. DO NOT EXCEED RECOMMENDED TORQUE SPECIFICATION

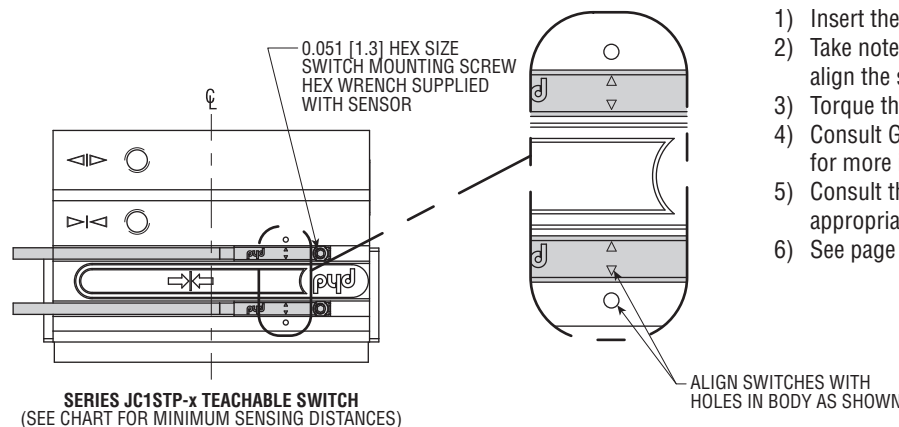
- 1) Insert the switch into the switch slot.
- 2) Adjust on / off position per your requirements.
- 3) Torque the socket set screw to 14 in-oz [0.1 Nm].
- 4) See page 1 for switches and cordsets part numbers.

NOTES:
 1) *HS2 DIMENSION APPLIES TO INDICATED END OF SWITCH HOUSING (NOT CABLE OR STRAIN RELIEF). SIZES WITHOUT HS2 REMAIN WITHIN GRIPPER BODY BOUNDARIES.
 2) METRIC INFORMATION SHOWN IN [] OR IN COLUMNS DESIGNATED mm.

DIMENSION - HS2* SERIES JC1SDx-x SINGLE POSITION INSTALLATION ORIENTATION

UNIT SIZE	JC1SDP-K TOP SLOT		JC1SDP-K BOTTOM SLOT	
	OPEN	CLOSE	OPEN	CLOSE
	19	CABLE LEFT	0.4 [10.2] CABLE RIGHT	CABLE LEFT
25 (GRS34)	CABLE RIGHT	0.158 [4.0] CABLE LEFT	CABLE RIGHT	CABLE RIGHT
25 (GRS33)	0.059 [1.5] CABLE RIGHT	0.335 [8.5] CABLE RIGHT	CABLE LEFT	CABLE LEFT
27	0.059 [1.5] CABLE RIGHT	CABLE LEFT	CABLE LEFT	CABLE LEFT
28	CABLE RIGHT	CABLE LEFT	CABLE LEFT OR RIGHT	CABLE LEFT
32-63	CABLE LEFT OR RIGHT	CABLE LEFT OR RIGHT	CABLE LEFT OR RIGHT	CABLE LEFT OR RIGHT

SERIES JC1STP-x TEACHABLE SWITCH



INSTALLING SERIES JC1STP-x SWITCHES. DO NOT EXCEED RECOMMENDED TORQUE SPECIFICATION

- 1) Insert the switch into the switch slot.
- 2) Take note of the \triangle symbol on the switch and carefully align the symbol shown in Figure 1.
- 3) Torque the socket set screw to 14 in-oz [0.1 Nm].
- 4) Consult GRS Design 2 [6] catalog at www.phdinc.com for more information switch sensing limitations.
- 5) Consult the JC1STP-x Information Sheet for the appropriate programming instructions.
- 6) See page 1 for switches and cordset part numbers.

NOTES:
 1) *MINIMUM DISTANCE BETWEEN SET POINTS MUST BE LESS THAN TOTAL JAW TRAVEL OF UNIT. SEE CATALOG DIMENSIONS FOR MINIMUM SHORT OR LONG TRAVEL.
 2) METRIC INFORMATION SHOWN IN [] OR IN COLUMNS DESIGNATED mm.

	SIZE																	
	19		25 (GRS34)		25 (GRS33)		27		28		32		40		50		63	
	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
*JC1STP-x Teachable Minimum Total Jaw Travel Distance Between Sensing Locations	0.138	3.5	0.138	3.5	0.197	5.0	0.138	3.5	0.138	3.5	0.138	3.5	0.217	5.5	0.276	7.0	0.551	14.0

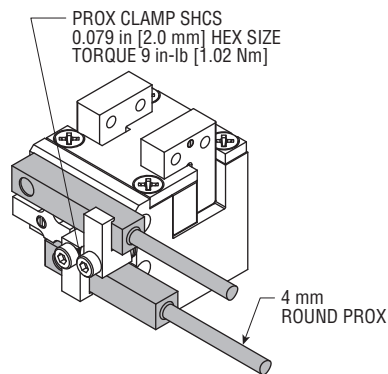
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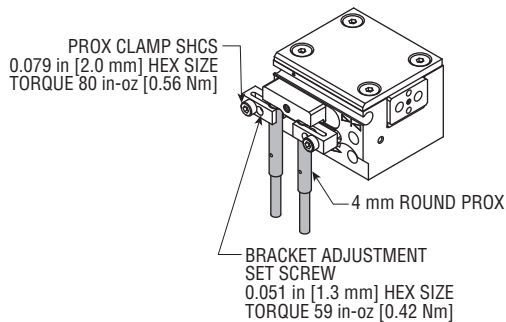
phd SWITCH MOUNTING INFORMATION: SERIES GRS DESIGN 2 [6] GRIPPERS

PROXIMITY SWITCH MOUNTING

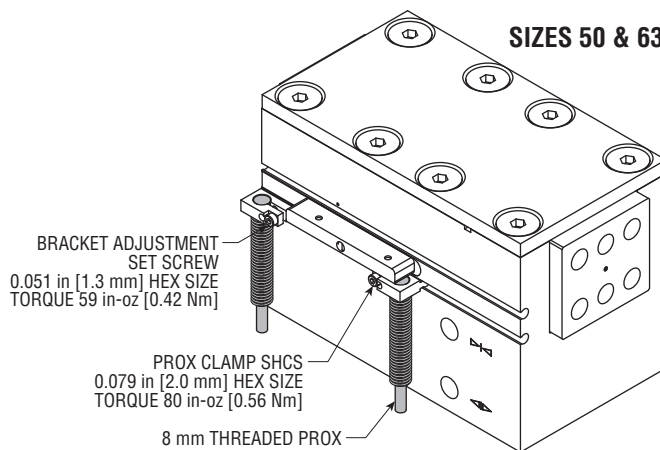
SIZE 19



SIZES 25, 27, 28, 32 & 40



SIZES 50 & 63



INSTALLING PROXIMITY SWITCHES. DO NOT EXCEED RECOMMENDED TORQUE SPECIFICATION

- 1) Install targets and brackets per instructions 6441-725 supplied with prox bracket kits and available online.
- 2) Insert proximity switches, lightly tighten prox clamp SHCS.
- 3) Slide switch brackets with switches into slots in body. Size 19 only - slide switches into brackets.
- 4) Adjust distance between switch and target so switch trips properly. Tighten SHCS to recommended torque specification. Size 19 only - snug, but do not torque, prox clamp SHCS.
- 5) Adjust on / off position of switch per your requirements.
- 6) Tighten bracket adjustment set screw to recommended torque. Size 19 only - torque prox clamp SHCS.
- 7) See GRS Design 2 [6] catalog at www.phdinc.com for recommended switch orientations and switch overhangs.
- 8) See page 1 for switches and cordset part numbers.

PROXIMITY SWITCH MOUNTING KITS

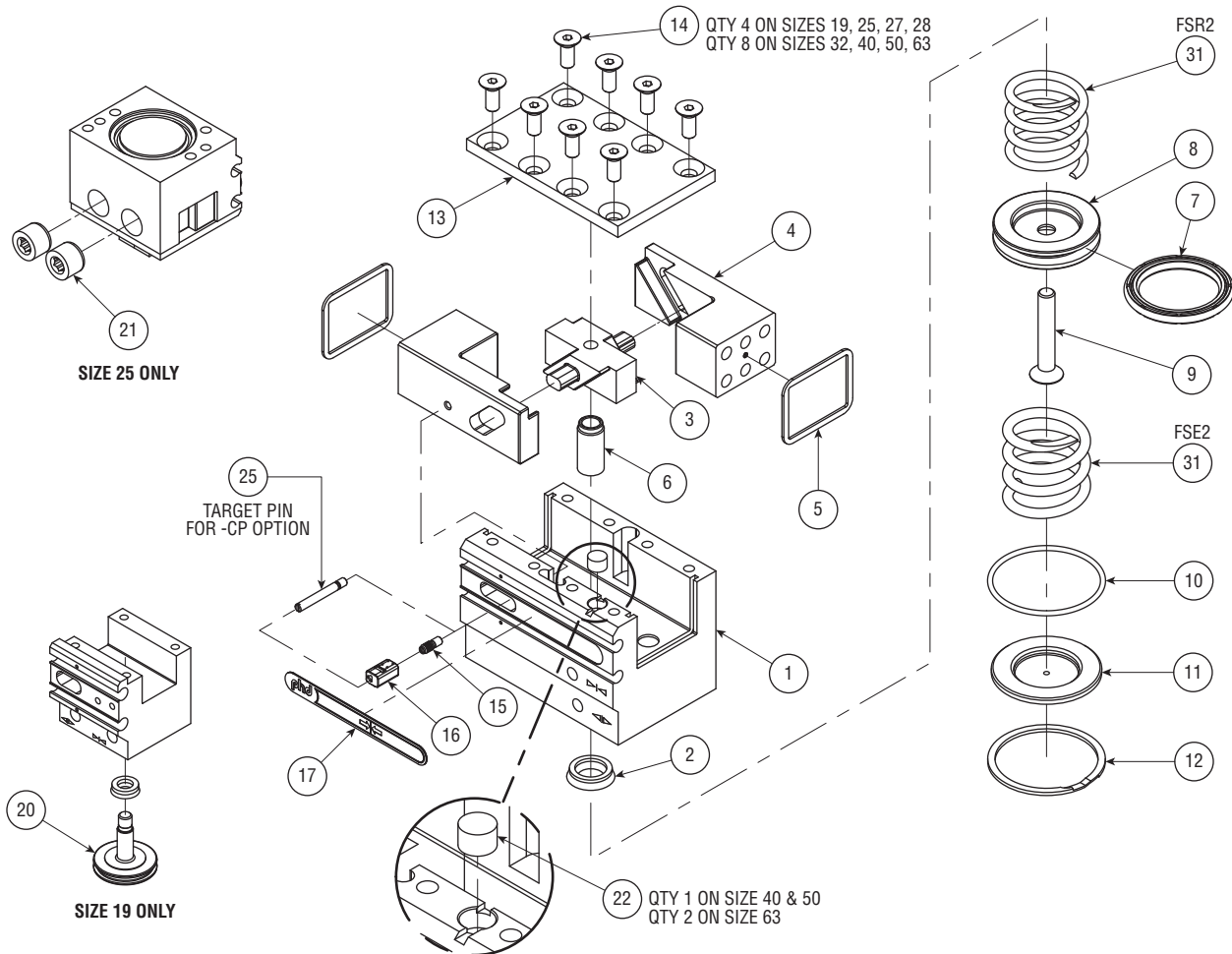
SIZE	KIT NUMBER	
	1 BRACKET	2 BRACKETS
19	88326-19-1	88326-19-2
25 (GRS34)	88326-25-1	88326-25-2
25 (GRS33)	88326-27-1	88326-27-2
27	88326-27-1	88326-27-2
28	88326-28-1	88326-28-2
32	88326-32-1	88326-32-2
40	88326-40-1	88326-40-2
50	88326-50-1	88326-50-2
63	88326-63-1	88326-63-2

Kit includes 1 target and 1 or 2 switch mounting brackets. Requires -CP option.

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phd PARTS LIST & KITS: SERIES GRS DESIGN 2 [6] GRIPPERS



KEY	PART DESCRIPTION	H CODE
1	Body Assembly	Full Unit Description required -H2400
3	Jaw Driver	Full Unit Description required -H5610
4	Jaw	Full Unit Description required -H2600
6	Rod (sizes 25 thru 63)	Full Unit Description required -H5810
8	Piston (sizes 25 thru 63)	Full Unit Description required -H1005
20	Piston & Rod Single Piece (size 19 only)	Full Unit Description required -H5810
9	Piston Assembly Fastener (sizes 25 thru 63)	Full Unit Description required -H2050
11	Bore Plug	Full Unit Description required -H3100
12	Bore Plug Retainer	Full Unit Description required -H7101
13	Jaw Cover	Full Unit Description required -H1200
14	Jaw Cover Assembly Fasteners	Full Unit Description required -H1440 (All Fasteners) -H1441 (One Fastener)
2	Rod Seal	Full Unit Description required sold as part of seal kit only -H9000
5	Jaw Seal (GRS33, Jaw Style 3 units only)	
7	Piston Seal	
10	Bore Plug Seal	
22	Air Filter (sizes 40, 50, 63)	
15	Magnetic Target Pin	Full Unit Description required -H5330
16	Magnetic Target	Full Unit Description required -H5335
17	Sensor Pin Slot Cover	Full Unit Description required -H5340
21	Bearing Screw (GRS34, size 25 only)	Full Unit Description required -H3400
25	-CP Target Pin	Full Unit Description required -H5331
31	-FSE2 / -FSR2 Straight Compression Spring	Full Unit Description required -H1600

NOTE: -H codes must be used with full unit description. This ensures the correct configuration of components is provided. Unless otherwise specified, -Hxxxx option code provides one replacement part.

REPLACEMENT MANIFOLD

SIZE	KIT NUMBER
19	88325-19-2
25	88325-25-2
27	88325-27-2
28	88325-28-2
32	88325-32-2
40	88325-40-2
50	88325-50-2
63	88325-63-2

NOTE: Kit includes 2 replacement o-rings and 1 spare o-ring

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