

# SKOFLO

High Flow Back Pressure Regulator



**SKOFLO** INDUSTRIES INC.

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[WWW.SKOFLO.COM](http://WWW.SKOFLO.COM)

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425.485.7816 FAX 425.486.5672

# SkoFlo Valve Model BPR10000MFC

## OPERATION AND MAINTENANCE INSTRUCTIONS

### INSTALLATION PROCEDURES:

- 1) Install valve so that the flow is in the proper direction. The "INLET" and "OUTLET" connections are Techlok H3in20 standard.
- 2) The "VENT" connection is not under pressure and will see fluid only if the piston seal is leaking. This connection is 1/4" NPT and may be routed to a drain or atmospheric container if desired. The "VENT" must remain free and unrestricted, and should be visible.
- 3) The "TEST/DRAIN" connections are MP Autoclave standard, 3/8" nominal size. They are under pressure during operation.
- 4) The supply pump pulsations must be adequately dampened with a pulsation dampener to avoid setting up a resonant vibration in the SkoFlo valve. This generally may occur with high flow rates and high pressure differentials. However, we highly recommend installation of a pulsation dampener in all cases. A bladder type pulsation dampener is preferred over a piston type. Reactive dampeners that use baffles will do little to dampen the SkoFlo back pressure regulator regardless of how they are sized.
- 5) The valve can be mounted in any orientation. The base plate can be moved to the opposite side of the valve assembly if required.

### START UP PROCEDURES:

- 1) Open the supply isolation valve to the back pressure regulator **slowly**.
- 2) Turn the pressure adjustment handle until you are at the desired pressure. Always start at a pressure below the set pressure and increase to the desired setting.
- 3) Adjust the check pressure so that at the entire range of flow, the pressure drop from P1 to P2 does not exceed 5000 PSI.
- 4) The back pressure regulator is now set and further adjustments aren't required. Tighten the lock nut on the handle to avoid inadvertent changes to the adjustment.

## OPERATION NOTES AND WARNINGS:

- 1) The SkoFlo Back Pressure Regulator has hard seats and is not designed to provide complete "bubble-tight" shut off. If tight shutoff is required, separate isolation valves should be used for shutting off the flow. **Overtightening the handle will not further reduce flow.** If back pressure does not increase when turning the handle in, see "Trouble Shooting Improper Valve Performance".
- 2) Do not flow backwards through the SkoFlo valve. Internal seals are designed for one direction only and could possibly become dislodged.
- 3) When lifting the SkoFlo valve, lift using M24 x 3 eyebolts in side of body or with 5/8 bolts through the mount plate. It is also possible to use slings around the welded inlet and outlet hubs with proper stabilization to avoid tilting. Do NOT lift using the handle as this can damage the handle.
- 4) Install a pulsation dampener between the pump discharge and the SkoFlo Back Pressure Regulator as required to avoid possible damage and noise from harmonic pulsations. A bladder type pulsation dampener is preferred over a piston type. Reactive dampeners that use baffles will do little to dampen the SkoFlo back pressure regulator regardless of how they are sized.
- 5) Install relief valve and/or burst plate upstream of the SkoFlo Back Pressure Regulator as required.
- 6) The vent from the spring chamber must not be blocked. Leave open to atmosphere, or route to a drain collection point at atmospheric pressure. This vent will only have fluid in the event of a leaking piston seal.
- 7) Due to the size of the handwheel it is possible to damage the stem while rotating counter clockwise (reducing pressure). Therefore slow down the handwheel rotation when approaching zero pressure. If the stem is over-torqued, there is a break-off stud (see the spare parts list) that can be replaced without removing the valve from service or breaking any valve seals. Contact SkoFlo Industries, Inc. for replacement instructions.

## MAINTENANCE NOTES:

- 1) Anytime that the check section is serviced, the internal pressure drop should be adjusted. Adjust the check pressure so that at the entire range of flow, the pressure drop from P1 to P2 does not exceed 5000 PSI.
- 2) When replacing valve seals, it is recommended that the new seals be lubricated with Parker Super Lube or equivalent. Install backup ring on low pressure side of o-ring. Make sure the backup ring is lined up at the joint.
- 3) Fastener and Torque Summary:

PARTS JOINED	FASTENER DESCRIPTION	THREAD COMPOUND	TORQUE REQUIRED
PRIMARY CAP FLANGE SCREWS	M24 -3.0 SHCS A4-70 316SS	NEVER SEIZE	110 -120 FT LBS
CHECK CAP FLANGE SCREWS	M30 -3.5 SHCS A4-70 316SS	NEVER SEIZE	230-250 FT LBS
TECHLOK SEAL BOLTS	TFE COATED	NONE	85 FT LBS
AUTOCLAVE PLUGS	MACHINED COMPONENTS	NEVER SEIZE	20-25 FT LBS
PRIMARY STEM RETAINER	MACHINED COMPONENTS	LOCKTITE #271	100-110 FT LBS
PRIMARY PIN HOLDER	MACHINED COMPONENTS	LOCKTITE #271	100-110 FT LBS
CHECK PIN RETAINER	MACHINED COMPONENTS	LOCKTITE #271	100-110 FT LBS
PRIMARY SPRING CAP	MACHINED COMPONENTS	NEVER SEIZE	60-80 FT LBS
MOUNT BASE BOLTS	M24 -3.0 SHCS A4-70 316SS	NEVER SEIZE	80-100 FT LBS

NOTE: Locktite #271 requires heat (such as a propane torch) to disassemble.

## TROUBLESHOOTING IMPROPER VALVE PERFORMANCE:

<u>SYMPTOM</u>	<u>CAUSE</u>	<u>REMEDY</u>
1. No flow	Upstream filter is plugged.	Clean or replace filter element.
	Back pressure regulator is plugged.	Take apart and clean. Correct cause of plugging such as leaking filter.
	Supply valve is shutoff.	Open valve <b>slowly</b> .
	Discharge line is shut off.	Open valve.
2. Excessive fluctuations in pressure(some fluctuation is normal, particularly with the large flow rate models)	Piston springs are not installed properly.	Install springs in accordance with assembly drawings
	Seat or pin worn or damaged.	Replace seat holder or pin.
3. Back pressure not being controlled by handle	Piston springs are not installed properly.	Install springs in accordance with assembly drawings

## RECOMMENDED SPARE PARTS:

<u>QTY</u>	<u>PART NUMBER</u>	<u>DESCRIPTION</u>
1	21191	Primary Stage Stem Stud
1	71003306	Primary Stage Seat Holder with Seat
1	71003307	Primary Stage Piston with Pin
1	21024	Check Stage Carbide Pin
1	21020	Check Stage Carbide Seat
1	71003308	Primary Stage Seal Kit
1	71003309	Check Stage Seal Kit

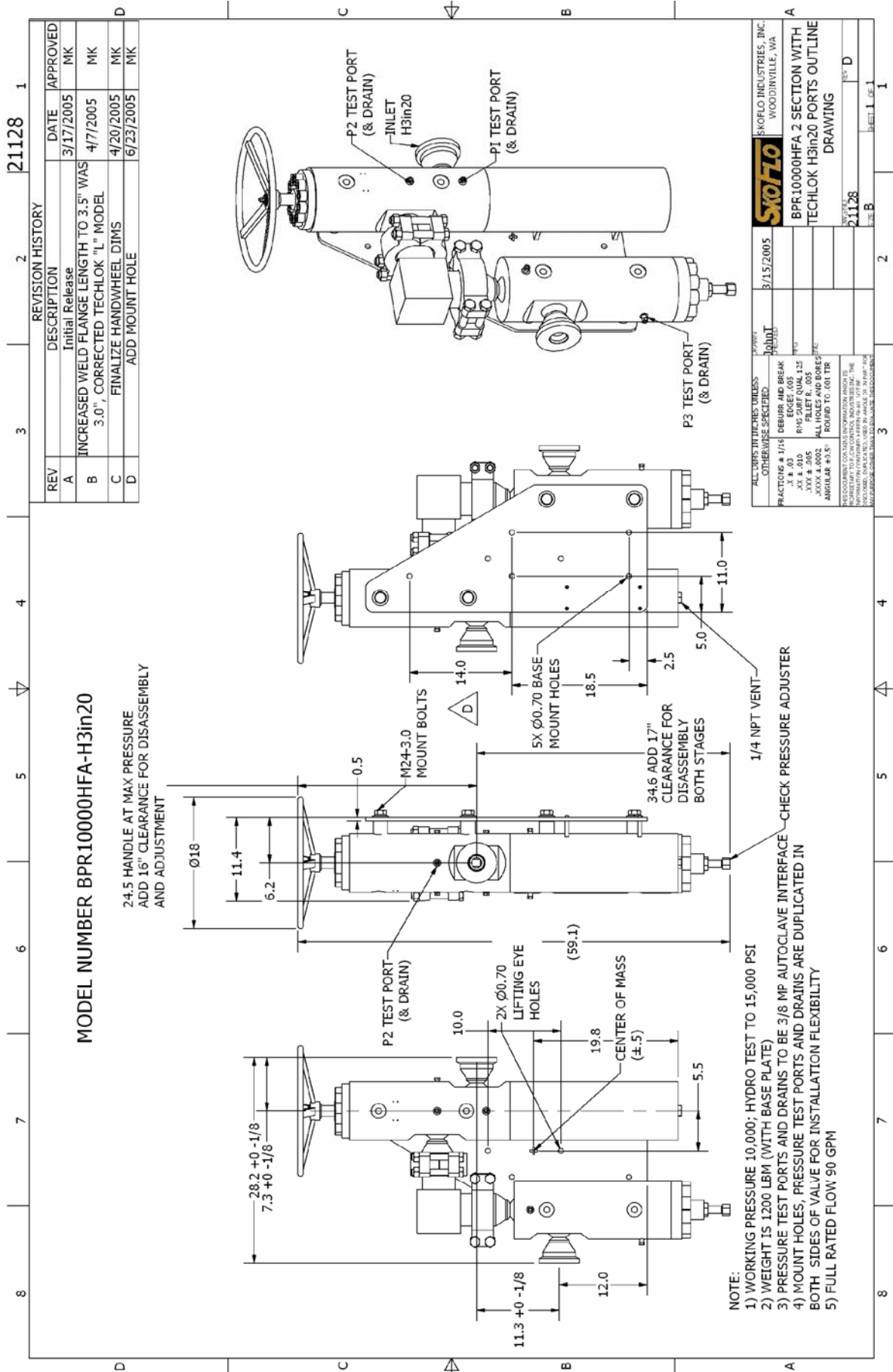
## STORAGE:

- 1) When storing SkoFlo valves prior to first use, it is recommended that the valves be stored Indoors. If stored outdoors, apply a light coating of protectant to the exterior of the valve. The shipping plugs in the inlet, outlet, drain/pressure ports and vent should remain in place.
- 2) When storing SkoFlo valves after being in use, dismantle, thoroughly clean and reassemble. Then store as noted in number 1 above.

Please call the factory in Woodinville, Washington USA at phone number (425)485-7816 if you have any questions.

E-Mail: [butchs@skoflo.com](mailto:butchs@skoflo.com)

**GENERAL ARRANGEMENT DRAWING:**



REV	DESCRIPTION	DATE	APPROVED
A	Initial Release	3/17/2005	MK
B	INCREASED WELD FLANGE LENGTH TO 3.5" WAS 3.0", CORRECTED TECHLOK "L" MODEL	4/7/2005	MK
C	FINALIZE HANDWHEEL DIMS	4/20/2005	MK
D	ADD MOUNT HOLE	6/23/2005	MK

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<p>ALL DIMS IN INCHES UNLESS OTHERWISE SPECIFIED</p> <p>FRACTIONS &amp; 1/16 DECIMAL AND BREAK</p> <p>.X .4 .03</p> <p>.XX .4 .03</p> <p>.XXX .4 .03</p> <p>ALL DIMS TO CENTER UNLESS SPECIFIED</p> <p>ALL DIMS TO FACE UNLESS SPECIFIED</p> <p>ALL DIMS TO CENTER UNLESS SPECIFIED</p> <p>ALL DIMS TO FACE UNLESS SPECIFIED</p>	<p>DATE: 8/15/2005</p> <p>DESIGNER: [REDACTED]</p> <p>DRAWN: [REDACTED]</p> <p>CHECKED: [REDACTED]</p> <p>APPROVED: [REDACTED]</p>
<p>SKO Flo INDUSTRIES, INC.</p> <p>WOODBRIDGEVILLE, VA</p>	<p>21128</p> <p>SHEET 1 OF 1</p>

## PRIMARY STAGE PARTS LIST:

ITEM	QTY	PART NUMBER	DESCRIPTION
16	1	21056	BPR15000HFA PRI STEM CUP SEAL RETAINER
20	1	21026	BPR15000HFA SEAT
22	1	21061	BPR15000HFA PRIMARY SPRING WASHER
24	1	21062	BPR15000HFA SPRING CAP
26	1	21058	BPR15000HFA PRIMARY PIN HOLDER
27	1	21024	BPR15000HFA PIN
28	1	21059	BPR15000HFA PRIMARY PISTON
36	1	21115	BPR15000HFA PRIMARY SECTION BODY WELDMENT
63	1	21057	BPR15000HFA SEAT HOLDER
64	1	21063	BPR15000HFA HANDLE
65	1	21064	BPR15000HFA PRI HANDLE PUSH ROD
66	1	21076	BPR15000HFA PRI PUSH ROD NUT
67	1	21175	BPR15000HFA PRIMARY STEM NUT
68	1	21191	BPR15000HFA PRI HANDLE STEM STUD
69	1	21183	BPR15000HFA HANDWHEEL RETAINING WASHER
84	1	21054	BPR15000HFA PRIMARY UPPER CAP/LINER
89	1	21060	BPR15000HFA PRIMARY LOWER CAP
90	1	21172	BPR15000HFA PRIMARY UPPER CAP BOLT FLANGE
91	1	21173	BPR15000HFA PRIMARY LOWER CAP BOLT FLANGE
204	3	71003115	BPR15000HFA PRIMARY PISTON/SEAT HOLDER CUP SEAL
205	1	71003125	BPR15000HFA CERAMIC SEAT O-RING
213	1	71003124	BPR15000HFA PRI LINER O-RING
214	1	21155	BPR15000HFA PRI LINER BACKUP RING
215	1	71001864	BPR15000HFA STEM CUP SEAL
230	1	21154	BPR15000HFA CERAMIC SEAT BACKUP RING
236	2	71003120	BPR15000HFA PRI CAP METAL SEAL
238	1	71003126	BPR15000 PRIMARY SPRING CAP O-RING
314	2	71002901	3/8-24 JAM NUT
315	1	71002915	3/8 FLAT WASHER
325	2	21209	BPR15000HFA CLOCKING DOWEL
361	1	71003208	WHM-175-S16 SPIRAL RING
363	1	71003214	WST-118-S16
372	22	71003165	SHCS M24-3 X 70, XYLAN COATED
403	1	71003132	HFA PIN SPRING SPRING
406	1	71003263	Ø1.125 GRADE 100 SILICONE NITRIDE BALL
414	5	71002083	3/8 AUTOCLAVE PLUG
415	5	71003288	3/8 MP AUTOCLAVE GLAND NUT
460	25	71003118	BPR15000HFA PRIMARY SPRING

## CHECK STAGE PARTS LIST:

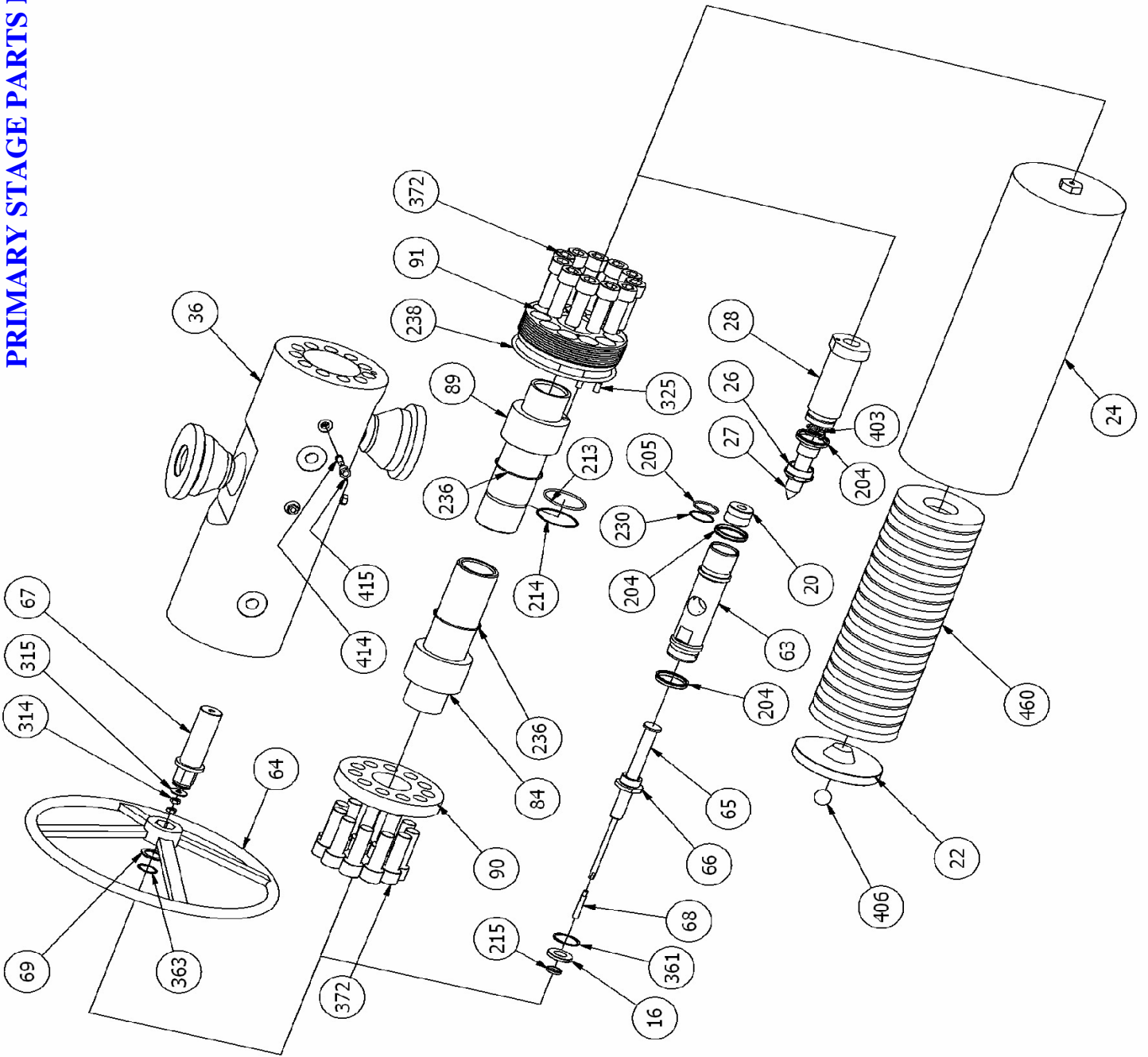
ITEM	QTY	PART NUMBER	DESCRIPTION
16	1	21056	BPR15000HFA PRI STEM CUP SEAL RETAINER
20	1	21020	BPR15000HFA CHECK SEAT
22	1	21079	BPR15000HFA CHECK PISTON SPRING COMPRESSOR
25	27	71003116	BPR15000HFA CHECK SPRING
27	1	21021	BPR15000HFA CHECK PIN
28	1	21073	BPR15000HFA CHECK PISTON
36	1	21120	BPR15000HFA CHECK BODY WELDMENT
65	1	21068	BPR15000HFA CHECK STEM
70	1	21053	BPR15000HFA STEM BUSHING
71	1	21055	BPR15000HFA STEM TIP
73	1	21042	BPR1500HFA CHECK PIN RETAINER
84	1	21072	BPR15000HFA CHECK CAP
90	1	21157	BPR15000HFA CHECK CAP FLANGE
92	1	21075	BPR15000HFA CHECK LINER
205	1	71003253	BPR15000HFA CHECK SEAT O-RING
215	1	71001864	BPR15000HFA STEM CUP SEAL
230	1	21153	BPR15000HFA CHECK SEAT BACKUP RING
236	1	71003121	BPR15000HFA CHECK CAP METAL SEAL
257	1	21080	BPR15000HFA CHECK LOWER PISTON RING
258	1	21116	BPR15000HFA CHECK UPPER PISTON RING
259	1	71003123	BPR15000HFA CHECK PIN FACE SEAL O-RING
314	1	71003234	1.0 UNF JAM NUT
325	1	20509	BPR15000HFA CHECK LINER CLOCKING DOWEL
326	2	21209	BPR15000HFA CLOCKING DOWEL
361	1	71003208	WHM-175-S16 SPIRAL RING
372	10	21167	SHSC - M30-3.5 X 100
402	2	71003117	BPR15000HFA CHECK SEAT RETAINING SPRING
403	1	21314	CHECK STEM SLEEVE, BPR15000HFA
404	1	71003457	Ø.750 GRADE 100 SILICONE NITRIDE BALL
405	1	21321	BPR15000HFA CHECK STEM PUSHROD
414	3	71002083	3/8 AUTOCLAVE PLUG (NOT SHOWN)
415	3	71003288	3/8 MP AUTOCLAVE GLAND NUT (NOT SHOWN)



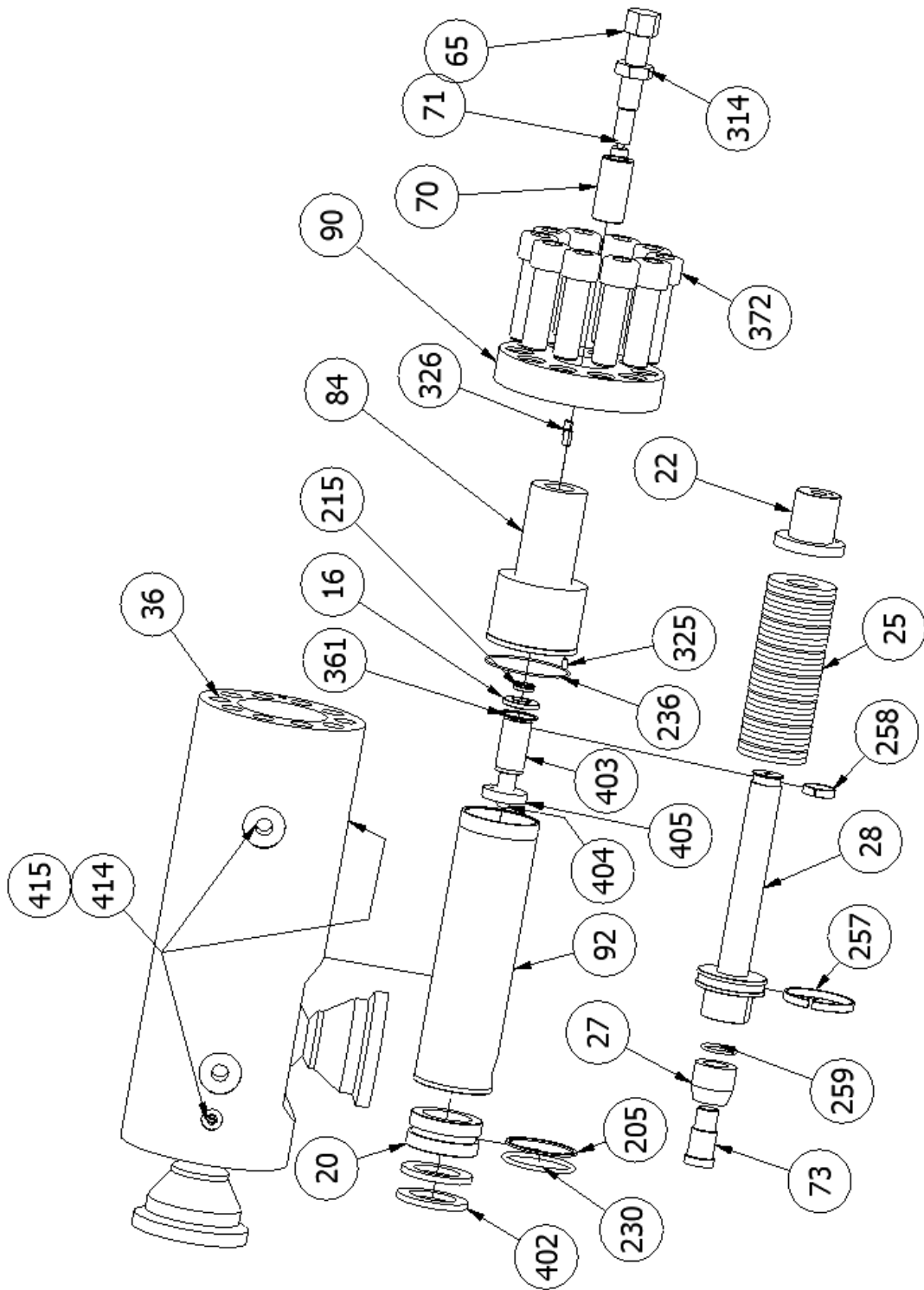
## VALVE ASSEMBLY PARTS LIST:

ITEM	QTY	PART NUMBER	DESCRIPTION
160	1	21126	BPR15000HFA PRIMARY SECTION
161	1	21127	BPR15000HFA CHECK SECTION
112	1	21129	BPR15000HFA BASE PLATE
114	2	21131	BPR15000HFA PRIMARY SPRING CAP SUPPORT
140	4	21152	SLEEVE, MOUNT. BPR15000HFA BODY
432	2	71003227	TECHLOK CLAMP SET H3"
434	1	71003156	BPR15000HFA PRIMARY/CHECK "L"
308	4	71003167	HHCS M24-3.0 X 100
339	4	71003168	M24 WASHER
340	4	71003169	M24 LOCKWASHER
433	1	71003226	SIZE 20 TECHLOK SEAL RING
341	4	71002933	SHCS M6-1 X 25

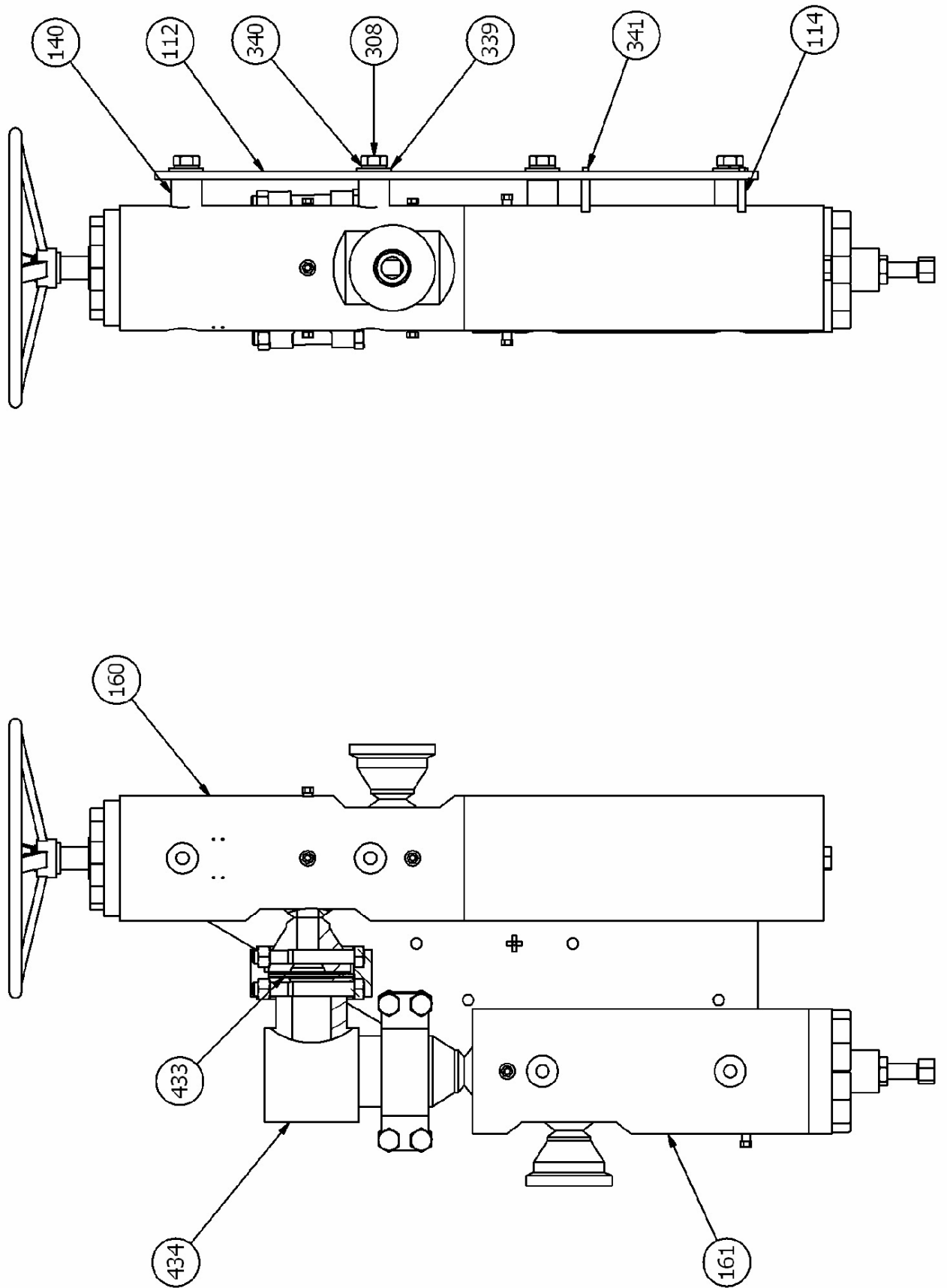
**PRIMARY STAGE PARTS DRAWING:**



**SECONDARY STAGE PARTS DRAWING:**



**VALVE ASSEMBLY PARTS DRAWING:**



# SKOFLO INDUSTRIES, INC.

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Our focus is on you our customer and for ISO 9001:2000 compliance we have prepared and request that you take the time to complete this **customer satisfaction survey**.

Company:	
Contact:	
Email:	
Phone:	

Please rate following categories	Highly Dissatisfied		N/A			Highly Satisfied	
	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. Product Quality	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Product Features	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Reliability	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. After sale support	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Implementation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Delivery	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Score from 1 (Low ) to 7 (High)	(Low)		N/A			(High)	
	1	2	3	4	5	6	7
Recommend SkoFlo to friend or colleague.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Likely to Purchase Products from SkoFlo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall quality of relationship with SkoFlo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall level of satisfaction with SkoFlo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall level of satisfaction with respect to Product Valve	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall level of satisfaction with respect to product engineering	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Level of confidence of SkoFlo abilities to provide compliant product	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Comments:							