

Bettis BHH Actuators

Hydraulic Double-Acting Balanced Rotary Actuator 90° Quarter-turn



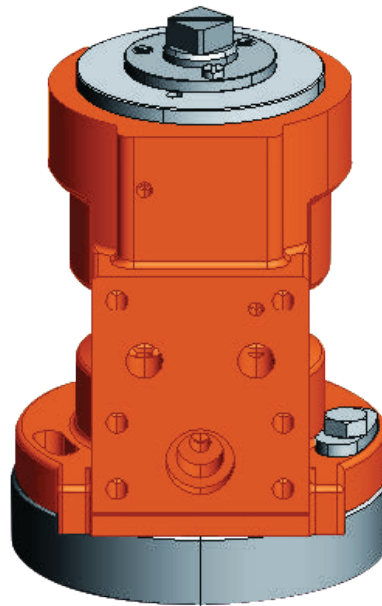
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Bettis BHH 250



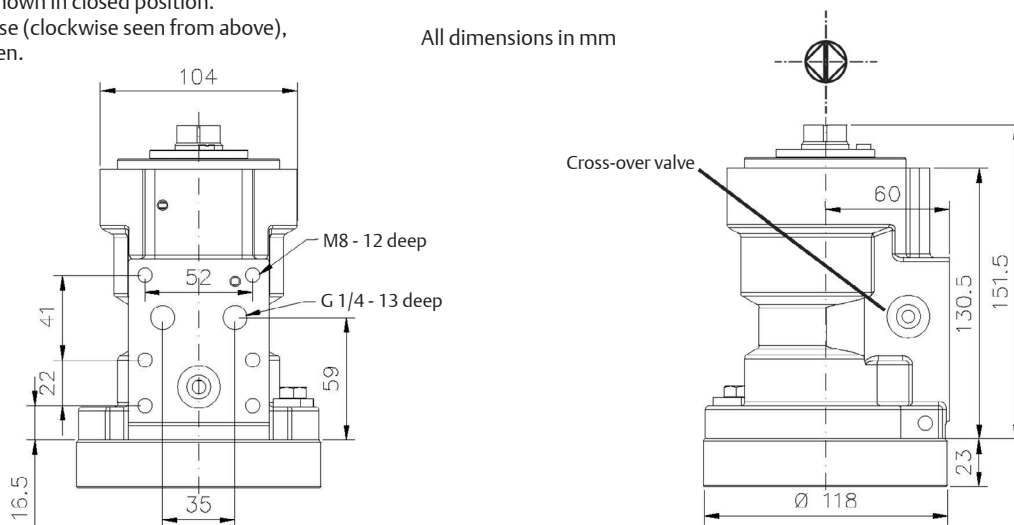
Main Data

Recommended working pressure range	30 - 135 bar
Burst test	675 bar
Total dry weight including mounting set (2.4 kg)	8.3 kg
Oil displacement	0.050 l
Temperature range	Normal application: -25 °C to +80 °C (NBR Seal set) High temperature application: -20 °C to +120 °C (Viton® Seal set) Low temperature application: -45 °C to +40 °C (T.L.T. NITRIL Seal set)
Rotation	90° ±1°
Hydraulic media and viscosities	We recommend acid-free hydraulic oil. Viscosity range: 15 - 200 cSt. For recommended brands and for other media than oil please refer to separate data sheet.

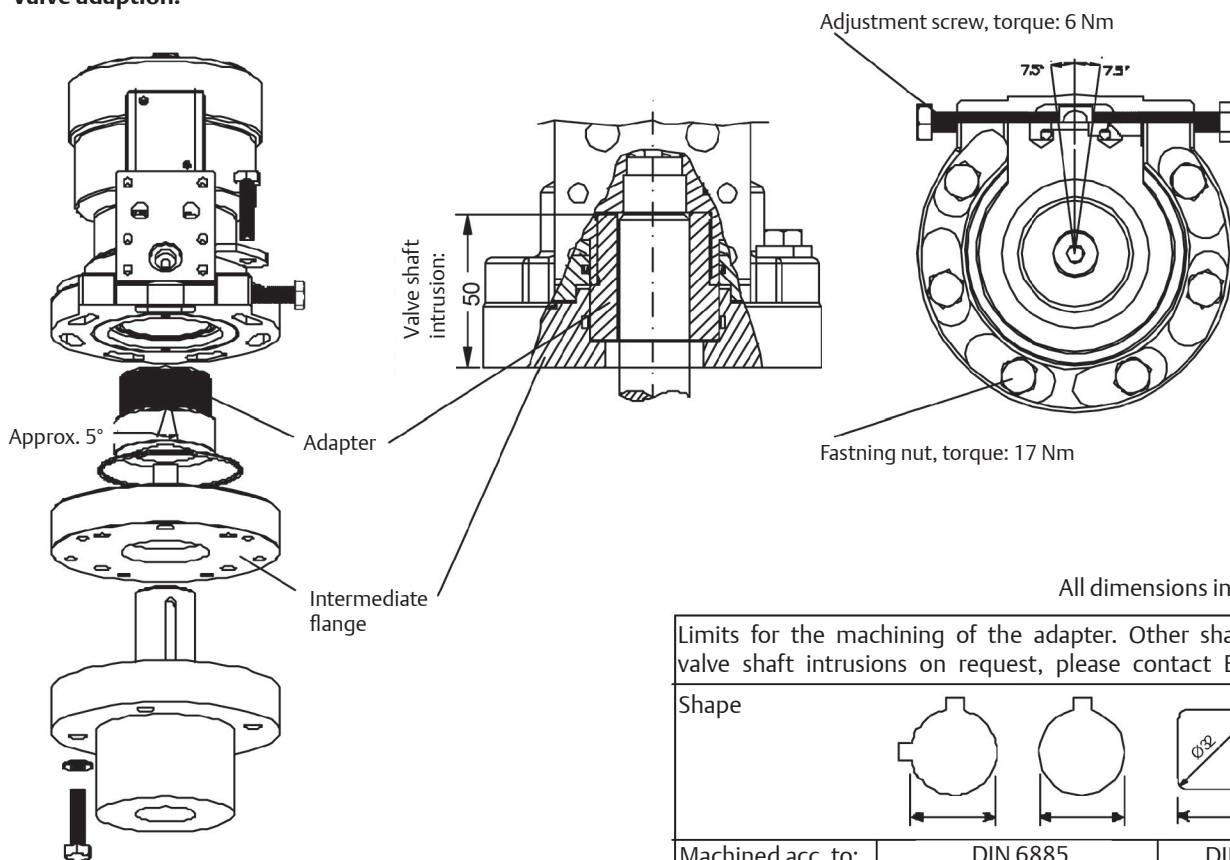
Main Dimensions

Actuator shown in closed position.
A port: Close (clockwise seen from above),
B port: Open.

All dimensions in mm



Valve adaption:

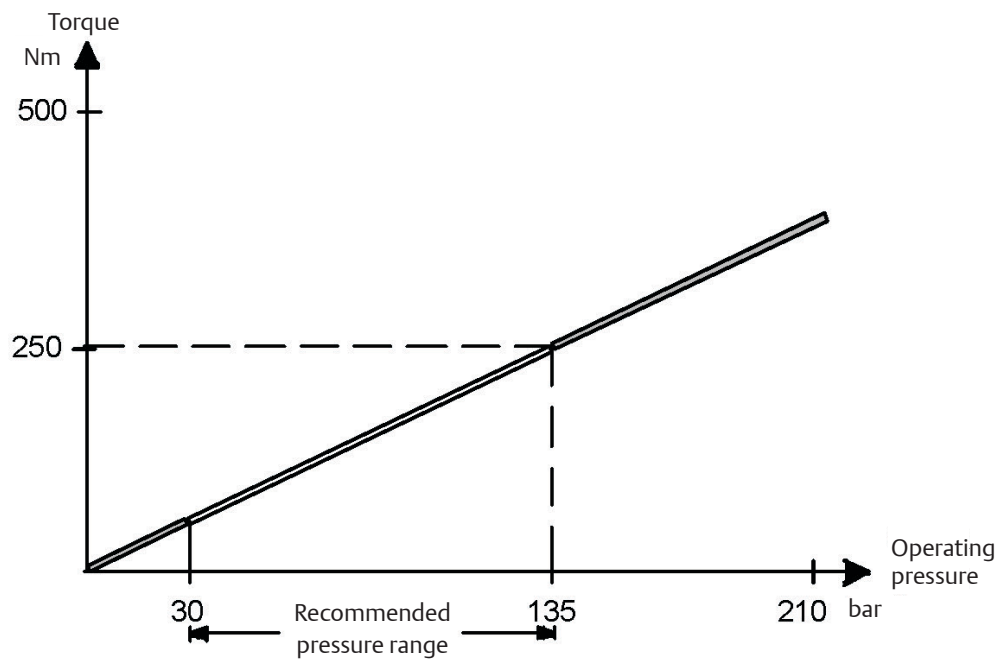


All dimensions in mm

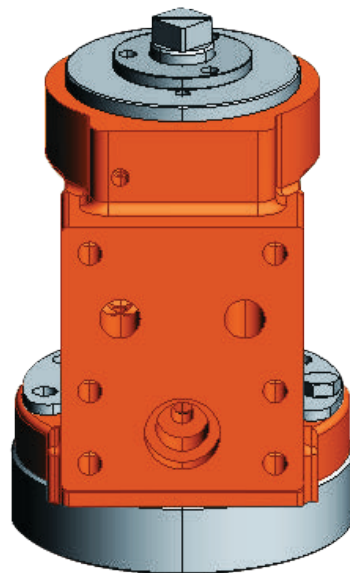
Limits for the machining of the adapter. Other shapes and valve shaft intrusions on request, please contact Emerson.

Shape			
Machined acc. to:	DIN 6885	DIN 79	
mm (max.):	$\varnothing 25$	$\varnothing 24$	

Performance



Bettis BHH 125



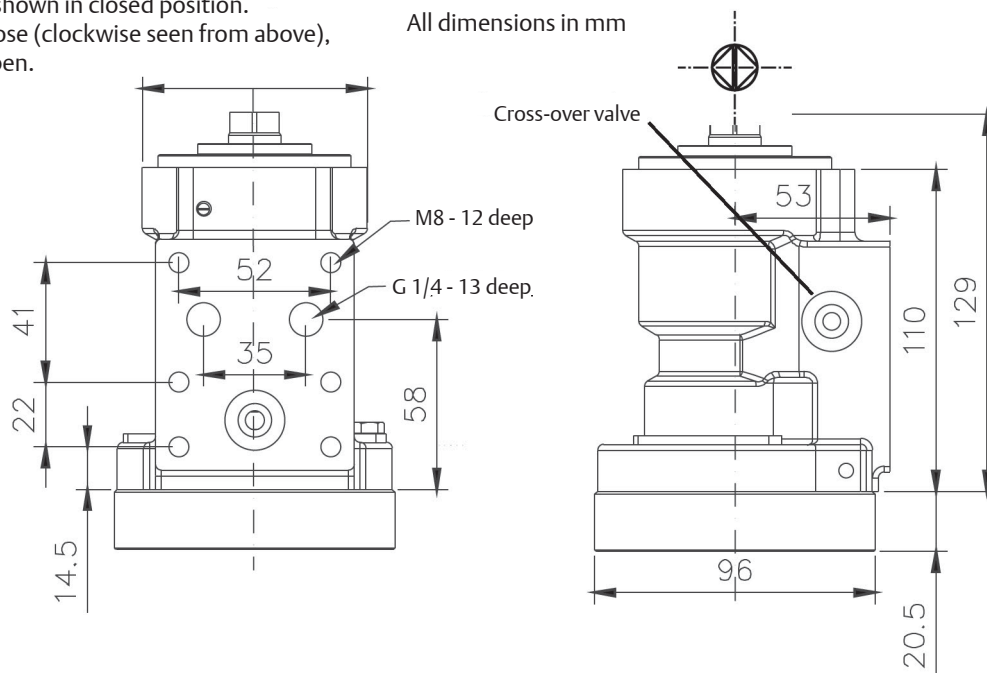
Main Data

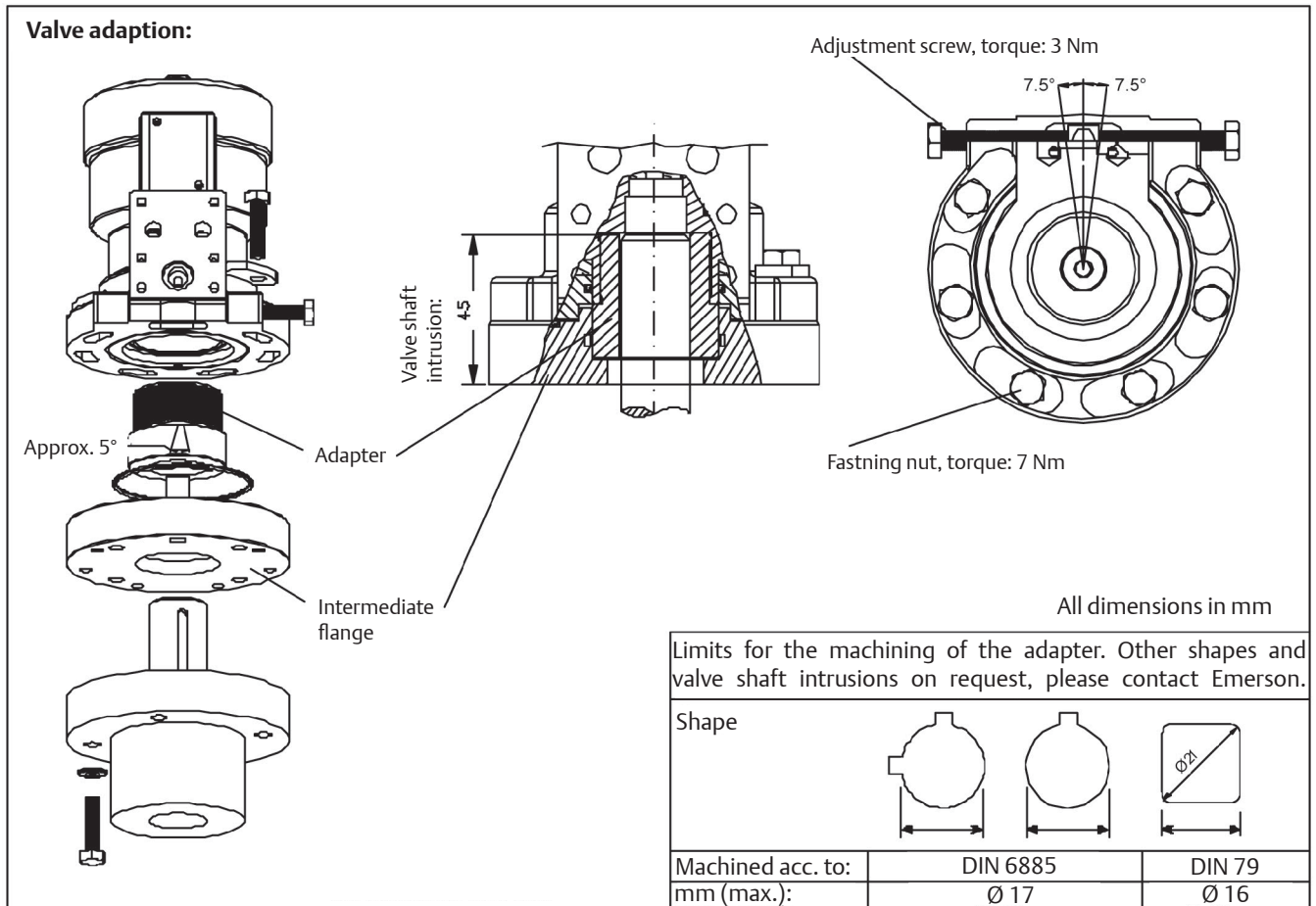
Recommended working pressure range	30 - 135 bar
Burst test	675 bar
Total dry weight including mounting set (1.4 kg)	5.3 kg
Oil displacement	0.026 l
Temperature range	Normal application: -25 °C to +80 °C (NBR Seal set) High temperature application: -20 °C to +120 °C (Viton® Seal set) Low temperature application: -45 °C to +40 °C (T.L.T. NITRIL Seal set)
Rotation	90° ± 1°
Hydraulic media and viscosities	We recommend acid-free hydraulic oil. Viscosity range: 15 - 200 cSt. For recommended brands and for other media than oil please refer to separate data sheet.

Main Dimensions

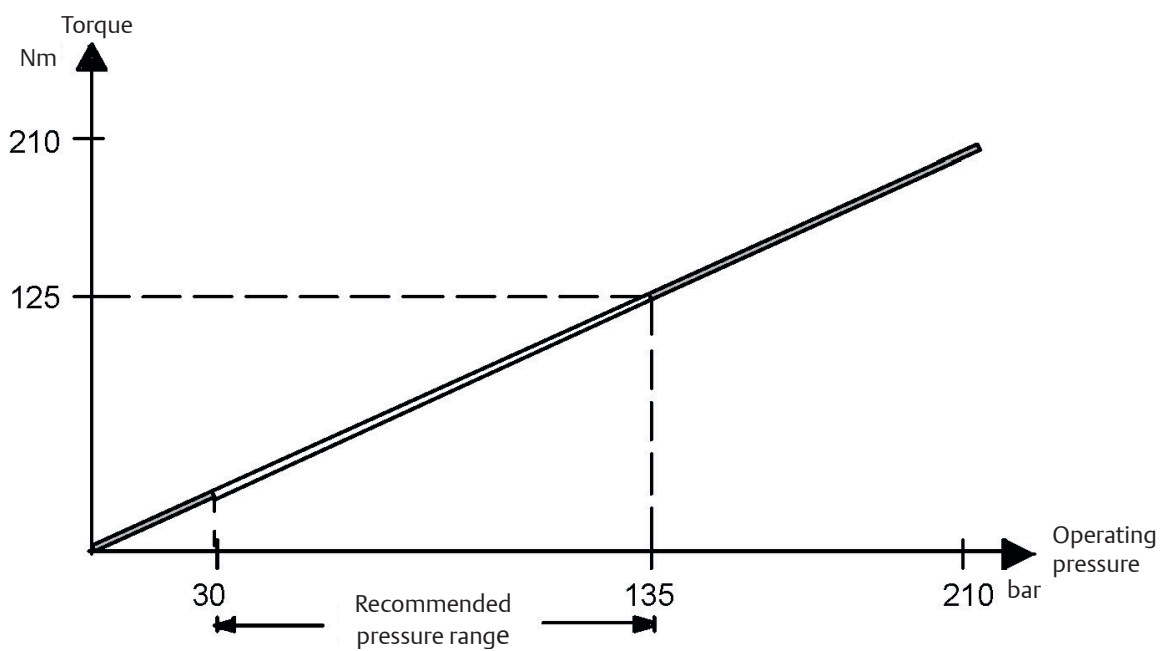
Actuator shown in closed position.
A port: Close (clockwise seen from above),
B port: Open.

All dimensions in mm





Performance



Bettis BHH 092



Materials

	Europe	U.S
Housing	GGG 40	A695-80
Piston	GGG 40	A395-80
Output shaft	SS 2142	ISO C18 Si35 Mn15 V08
Indicator shaft	SS 2382	AISI 430
Intermediate flange	St. 50-2	(A 675 grade 70)
Adapter	SS 2142	ISO C18 Si35 Mn15 V08
Coating:	Primer:	Min. 40 micron epoxy ester
	Top coat:	Min. 25 micron alkyd, red

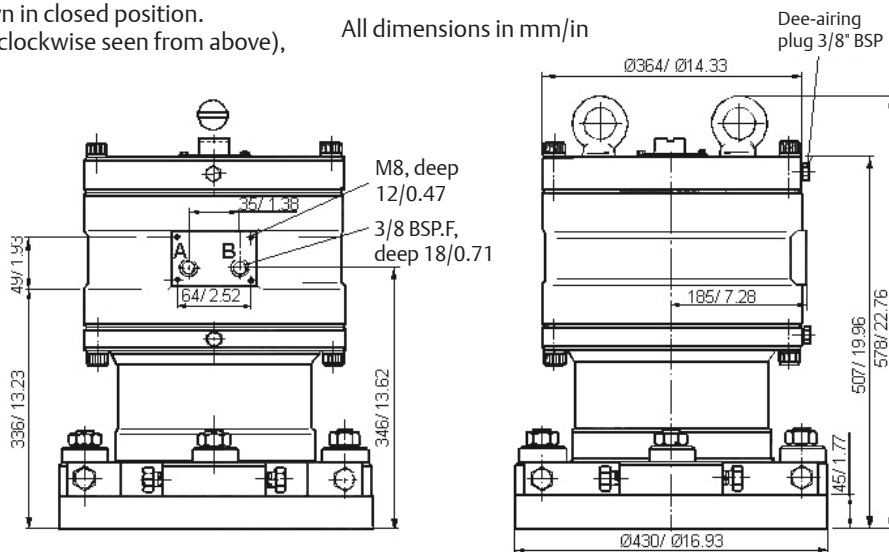
Main Data

Burst test	420 bar/6092 lbf/in ²
Max. working pressure	210 bar/3046 lbf/in ²
Total dry weight	274 kg/604 lb including 53 kg/372 lb for mounting set
Oil displacement	6100 cm ³ /190 in ³
Temperature range	-20 °C to +80 °C/-4 °F to 176 °F
Rotation	90° ±1°
Hydraulic media and viscosities	We recommend acid-free hydraulic oil. Viscosity range: 15 - 200 cSt. For recommended brands and for other media than oil please refer to separate data sheet.

Main Dimensions

Actuator shown in closed position.
A port: Close (clockwise seen from above),
B port: Open.

All dimensions in mm/in



The depicted actuator features the characteristic Bettis 4-lug foot with adjusting screws for precise trim of either fully open or fully closed valve position.

This foot design is adequate for transferring torques achieved at working pressure up to 105 bar. For frequent operation at more than 105 bar working pressure choose the flange-footed version.

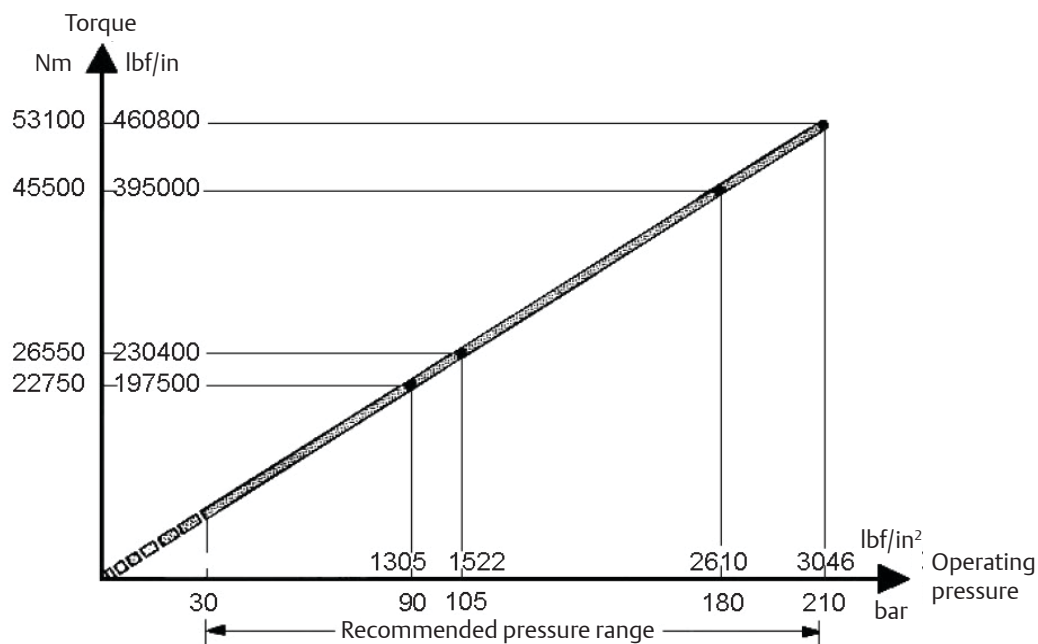
Valve adaption:

Adjustment screw, torque: 120 Nm/1040 lbf/in
Fastening nut, torque: 420 Nm/3620 lbf/in
Max. value shaft intrusion: 235/ 9.25
7.5°
7.5°
Output shaft to be machined according to valve shaft
Intermediate flange
5/ 0.19
Ø235 f8/ Ø9.25
Ø80/ Ø3.15
DCD 360/ HC 14.17
4/ 0.15
Ø32.1/ Ø1.26
4 x M24 x 1.5
All dimensions in mm/in

Limits for the machining of the adapter.

Shape					
mm	120	120	120	100	p+q 138
in.	4.72	4.72	4.72	4.09	5.43

Performance



Bettis BHH 072° - 180°



Materials

	Europe	U.S
Housing	GGG 40	A695-80
Piston	GGG 40	A395-80
Output shaft	SS 2142	ISO C18 Si35 Mn15 V08
Indicator shaft	SS 2382	AISI 430
Intermediate flange	St. 50-2	(A 675 grade 70)
Adapter	SS 2142	ISO C18 Si35 Mn15 V08
Coating:	Primer:	Min. 40 micron epoxy ester

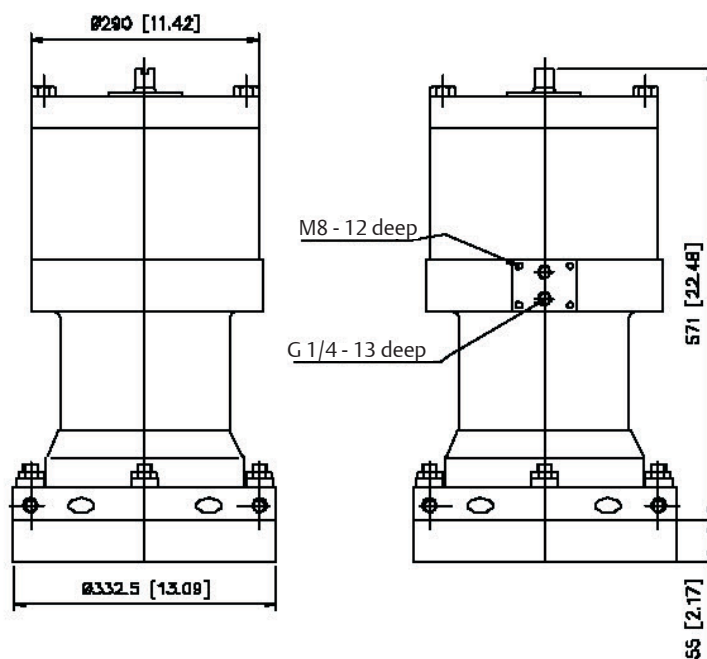
Main Data

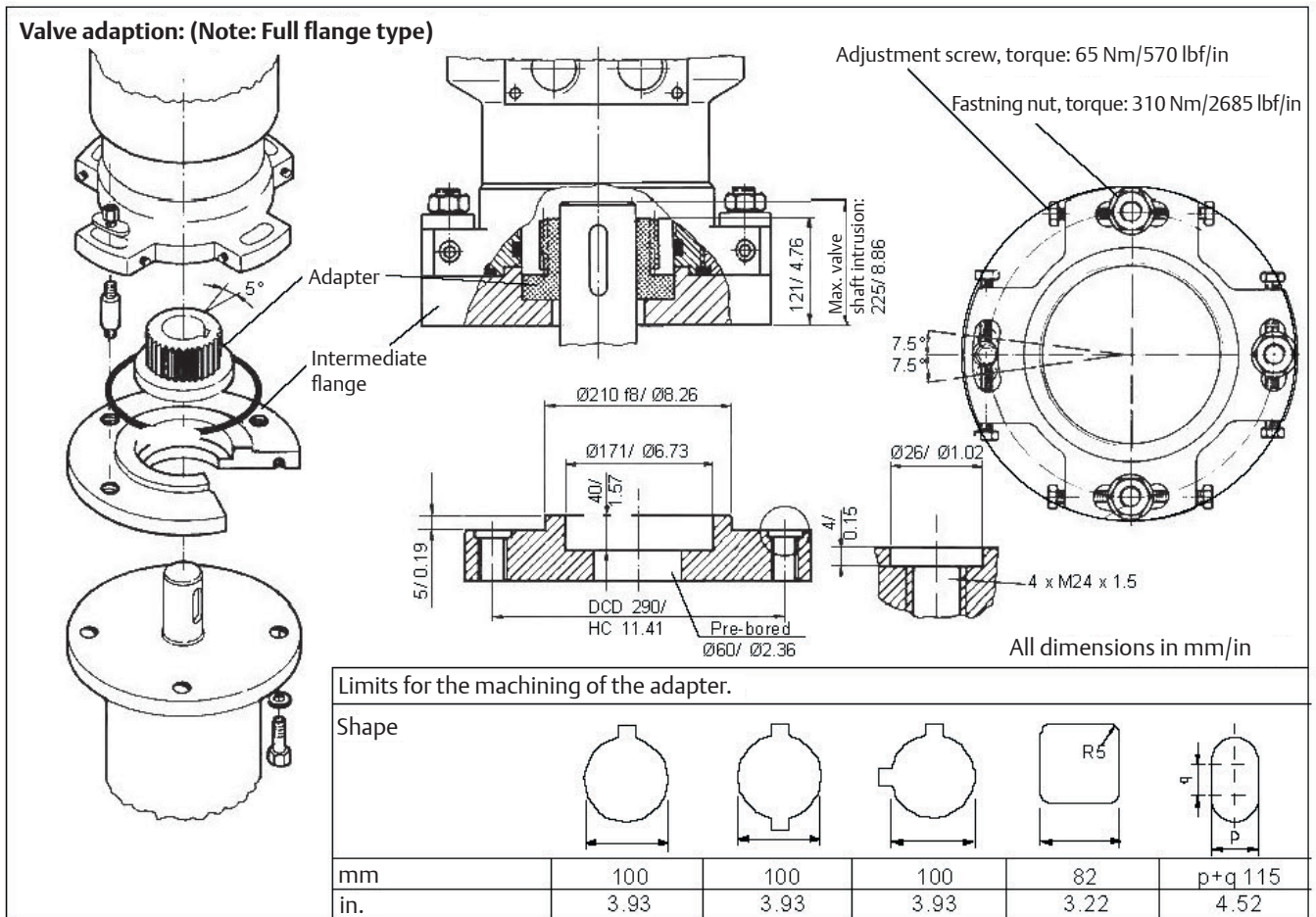
Burst test	540 bar/7832 lbf/in ²
Max. working pressure	210 bar/3046 lbf/in ²
Total dry weight	186 kg/410 lb including 54 kg/119 lb for mounting set
Oil displacement	6200 cm ³ /380 in ³
Temperature range	-20 °C to +80 °C/-4 °F to 176 °F
Rotation	180° ±1°
Hydraulic media and viscosities	We recommend acid-free hydraulic oil. Viscosity range: 15 - 200 cSt. For recommended brands and for other media than oil please refer to separate data sheet.

Main Dimensions

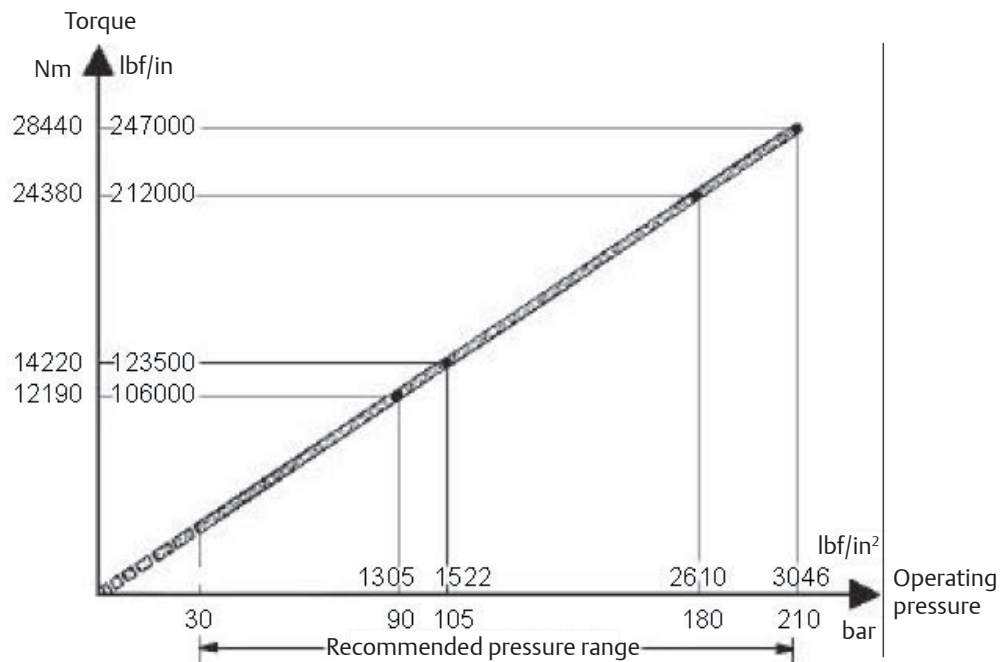
Actuator shown in closed position.
A port: Close (clockwise seen from above),
B port: Open.

All dimensions in mm/in





Performance



Bettis BHH 052



Materials

	Europe	U.S
Housing	GGG 40	A695-80
Piston	GGG 40	A395-80
Output shaft	SS 2142	ISO C18 Si35 Mn15 V08
Indicator shaft	SS 2382	AISI 430
Intermediate flange	St. 50-2	(A 675 grade 70)
Adapter	SS 2142	ISO C18 Si35 Mn15 V08
Coating:	Primer: Min. 40 micron epoxy ester Top coat: Min. 25 micron alkyd, red	

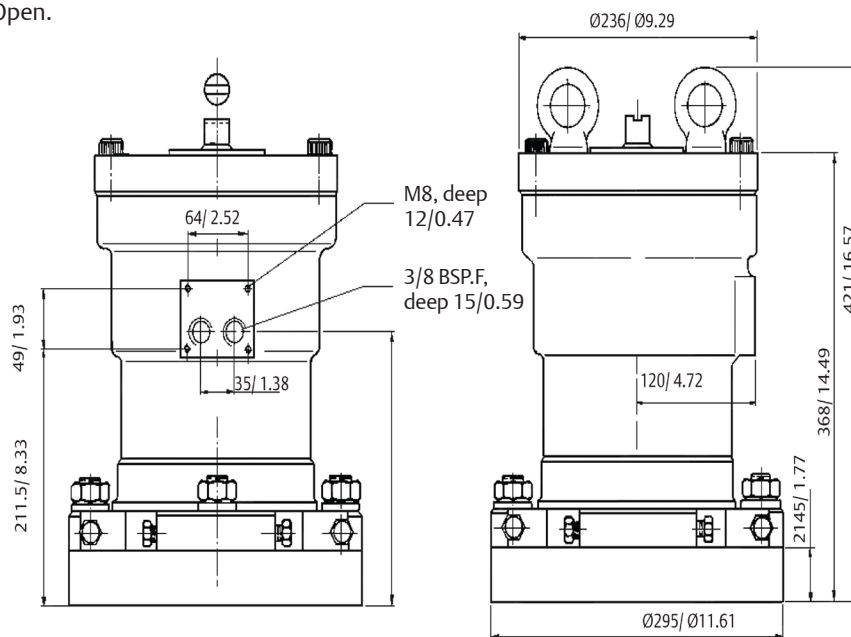
Main Data

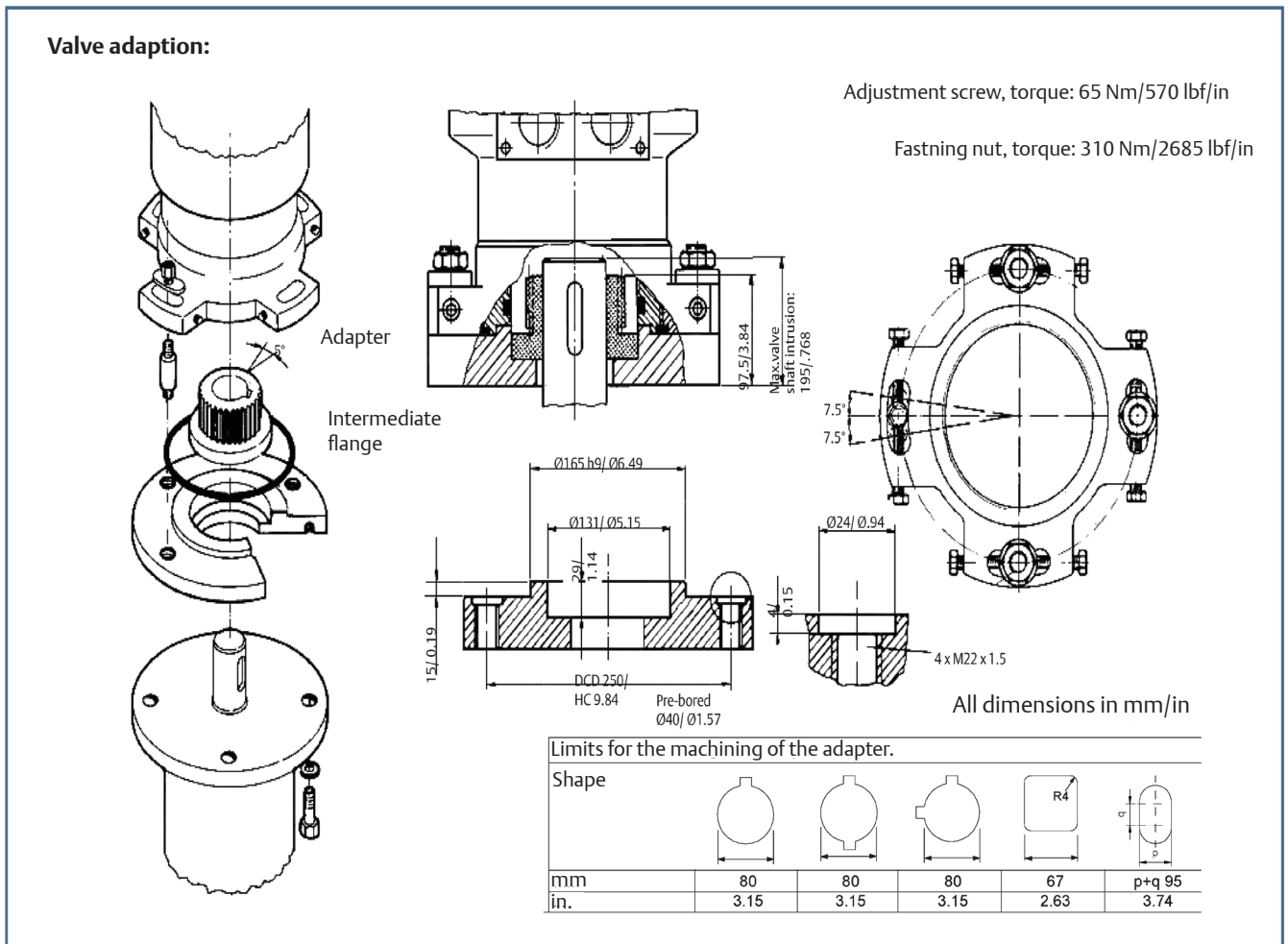
Burst test	640 bar/9282 lbf/in ²
Max. working pressure	210 bar/3046 lbf/in ²
Total dry weight	96 kg/212 lb including 31 kg/68 lb for mounting set
Oil displacement	1500 cm ³ /91.5 in ³
Temperature range	-20 °C to +80 °C/-4 °F to 176 °F
Rotation	90°±1°
Hydraulic media and viscosities	We recommend acid-free hydraulic oil. Viscosity range: 15 - 200 cSt. For recommended brands and for other media than oil please refer to separate data sheet.

Main Dimensions

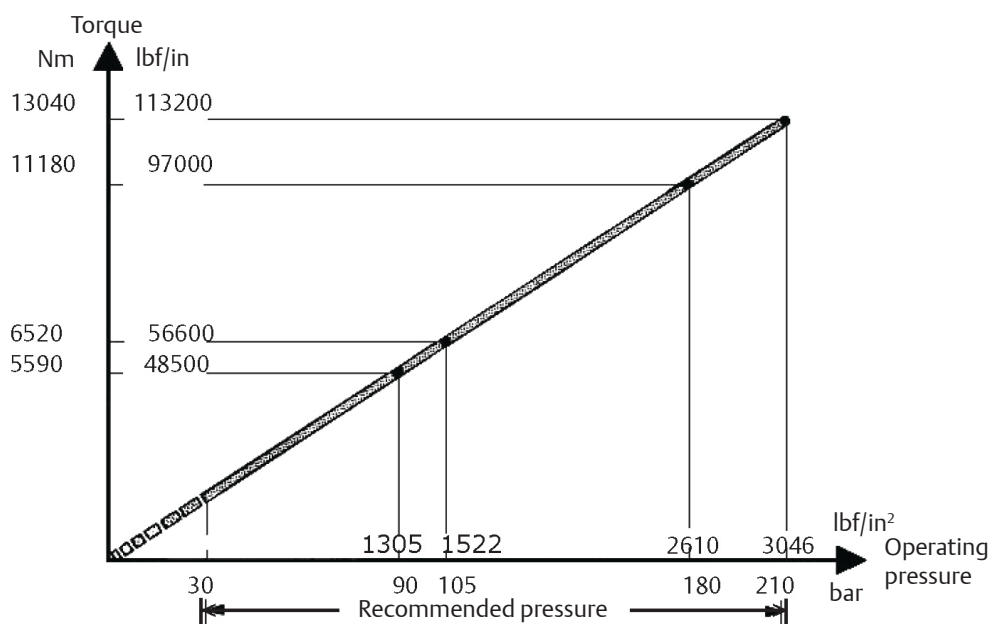
Actuator shown in closed position.
A port: Close (clockwise seen from above),
B port: Open.

All dimensions in mm/in

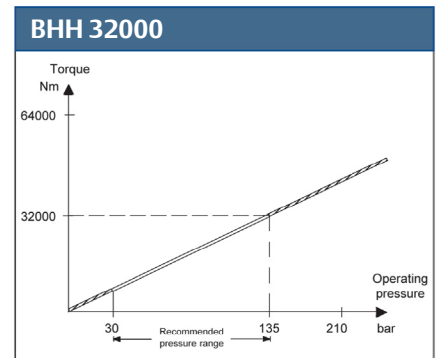
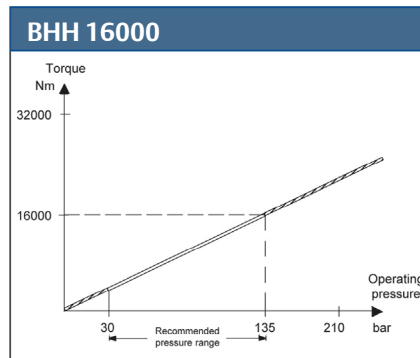
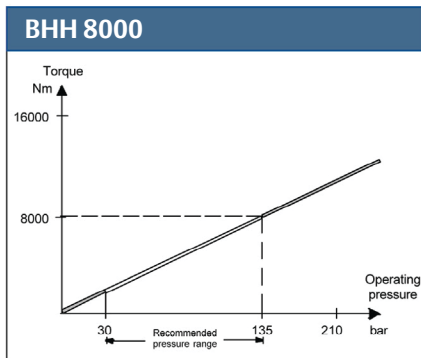
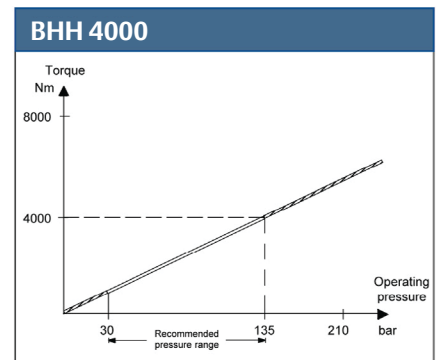
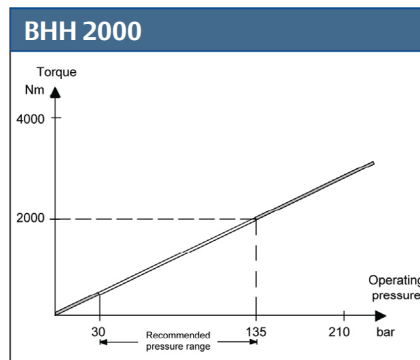
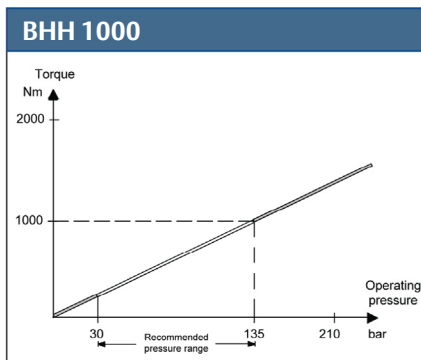
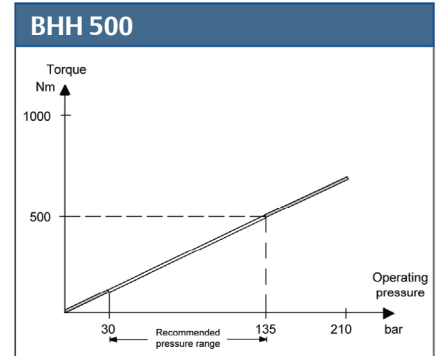
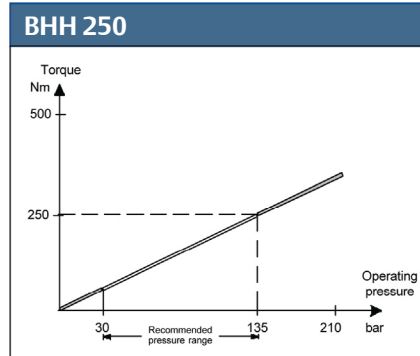
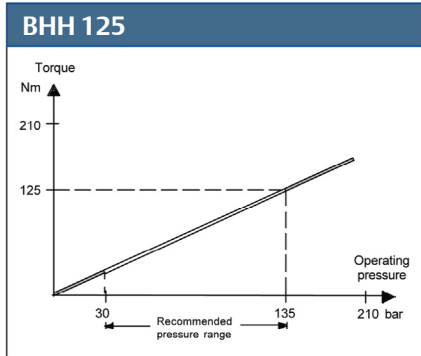




Performance

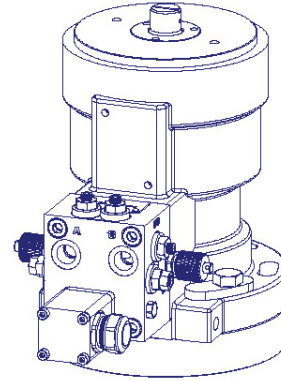


Bettis BHH Torque Survey



Bettis BHH Actuator for Operation of Quarter-Turn Valves

- Unique and simple design built-in cross-over valve.
- Compactness and high-torque output.
- Reliable and rugged, with more than 30 years service records on basic design.
- Balanced rotary principle eliminates side forces and/or bending of valve spindle.
- Will operate in sea air as well as sea water.
- Easy adaption to all well-known quarter-turn valves.
- Unlimited mounting positions and with built-in adjustments for end stops of rotary movement.
- Prepared for direct built-on modular control functions.



Actuator mounted with control block and EI indicator

Standard Optionals

- Hydraulic on/off indication (bypass).
- EI on/off or continuous indication IP 68.
- Connection block with e.g. filter.
- Double pilot operated non-return valve.
- Double release valve.
- Double throttle valve.
- Quick connection for emergency operation with portable hand pump.
- Built-on emergency operation hand pump.
- Submersion cover.
- Epoxy coating.

On request specific features as:

- Flushing valve built into the connection block making it possible to flush the system without disconnection of pipes.
- Safety equipment as mechanical locking device of actuator in closed position.

Actuator Mounted Control Equipment

See separate data sheet for the whole range of control blocks and other actuator mounted control components. (Interface for Cetop 3 valves).

Manufacture

The BHH actuators are manufactured in accordance with the guidelines for quality system stated in the ISO standard.

After assembly each actuator is flushed according to ISO 4406 21/19/16 standard and plugged.

Flushing according to ISO 4406 18/16/13 standard can be performed on request.

Classification

Meets the requirements from the major classification and approval authorities like:

- Det Norske Veritas
- Lloyd's Register of Shipping
- American Bureau of Shipping
- RINA
- Russian Register of Shipping
- Bureau Veritas
- Germanischer Lloyd
- U.S Coast Guard

Main Data

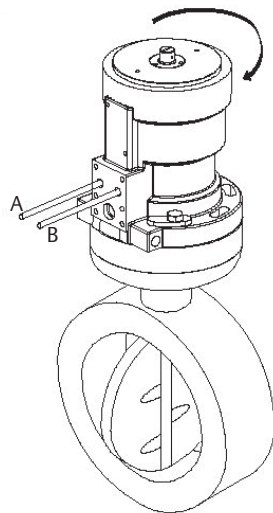
Temperature range	-20 °C to +80 °C, seals NBR (other temperature ranges on request)
Housing	GGG 40
Piston	GGG 40
Output shaft	SS 2142
Indicator shaft	AISI 316
Intermediate flange	St 52-3/AISI 316/GGG40
Adapter	SS 2142
Coating data:	Primer: Min. 40 micron, type Hempel EE 13140 Top coat: Min. 25 micron alkyd, red no. 51320

Operating Restrictions

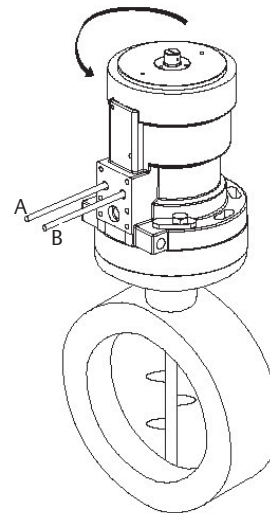
Please observe specific rules and demands from the classification societies and authorities concerning operating pressure and temperature range. (Example - ABS: Max. operating pressure = 20% of burst pressure). For extreme cycle speeds, loads and lifetime expectations please consult manufacturer.

Turning Direction in Relation to "A" and "B"

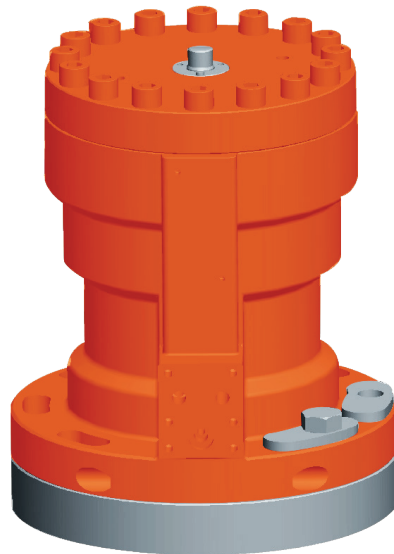
Pressure on "A" -
Indicator slot is moving clockwise -
Valve closed and indicator slot is parallel to mounting area.



Pressure on "B" -
Indicator slot is moving counter clockwise -
Valve open and indicator slot is perpendicular to the mounting area.



Bettis BHH 32000



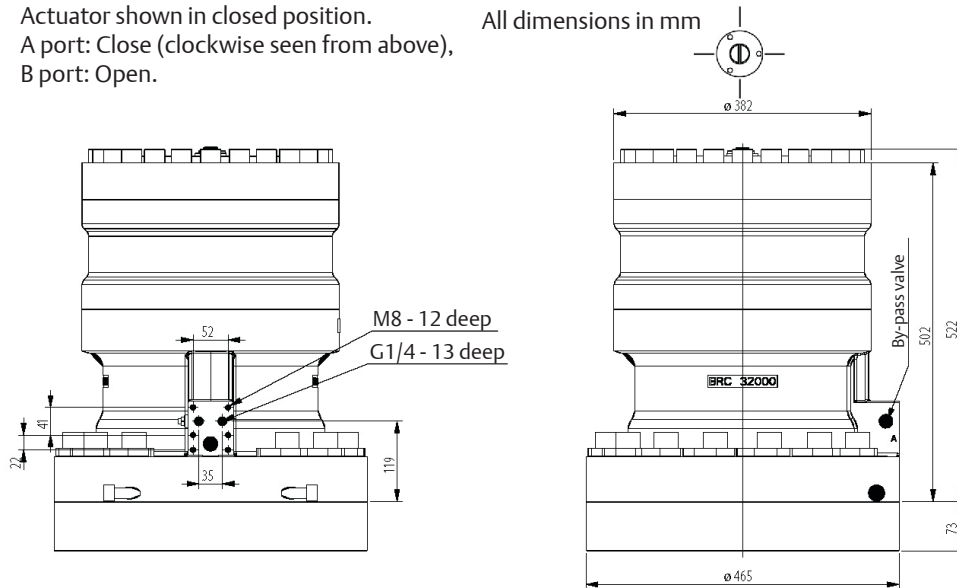
Main Data

Recommended working pressure range	30 - 135 bar
Burst test	675 bar
Total dry weight including mounting set (119 kg)	441 kg
Oil displacement	6.1 l
Temperature range	Normal application: -25 °C to +80 °C (NBR Seal set)
Rotation	90° ±1°
Hydraulic media and viscosities	We recommend acid-free hydraulic oil. Viscosity range: 15 - 200 cSt. For recommended brands and for other media than oil please refer to separate data sheet.

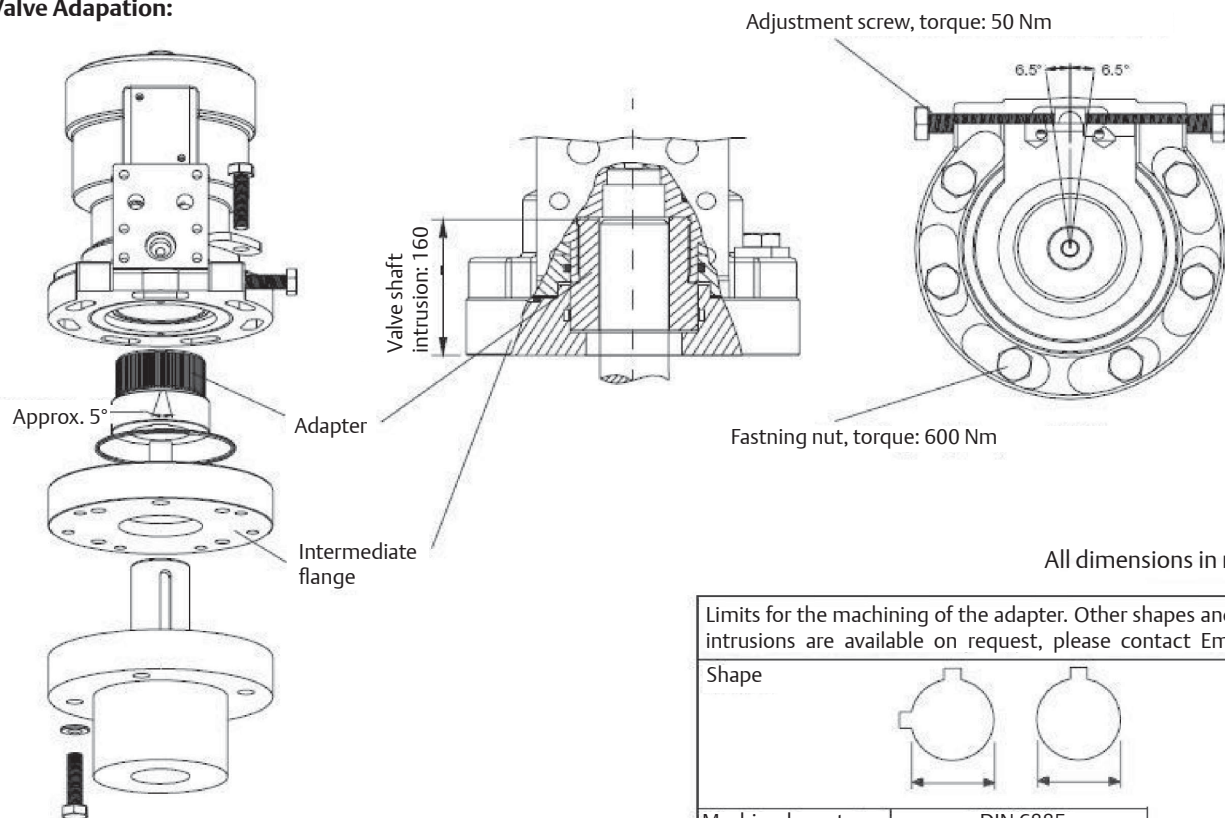
Main Dimensions

Actuator shown in closed position.
A port: Close (clockwise seen from above),
B port: Open.

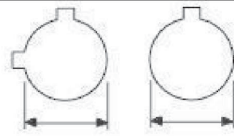
All dimensions in mm



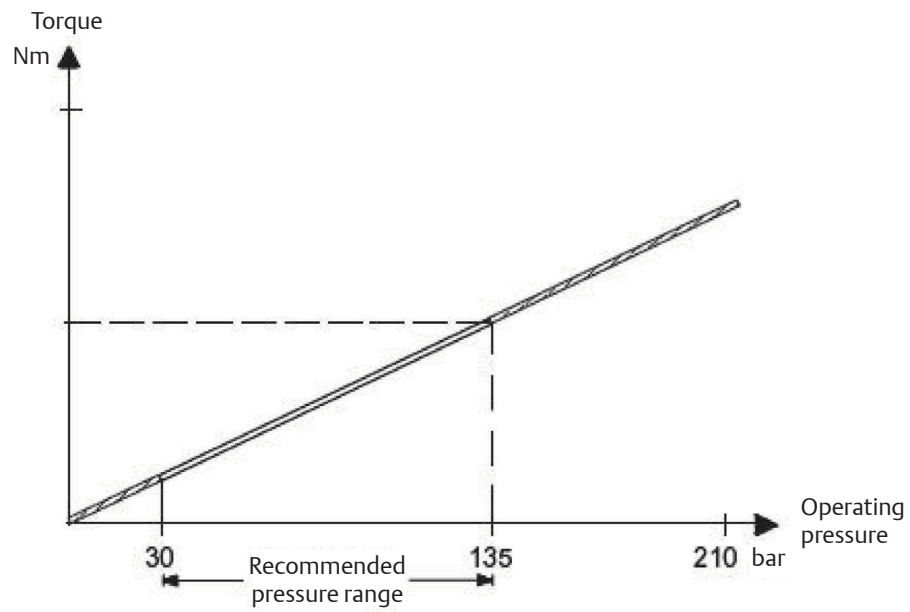
Valve Adaption:



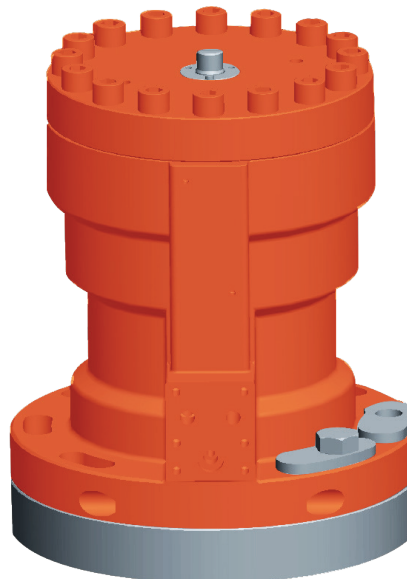
Limits for the machining of the adapter. Other shapes and valve intrusions are available on request, please contact Emerson.

Shape	
Machined acc. to:	DIN 6885
mm (max.):	$\phi 160$

Performance



Bettis BHH 16000



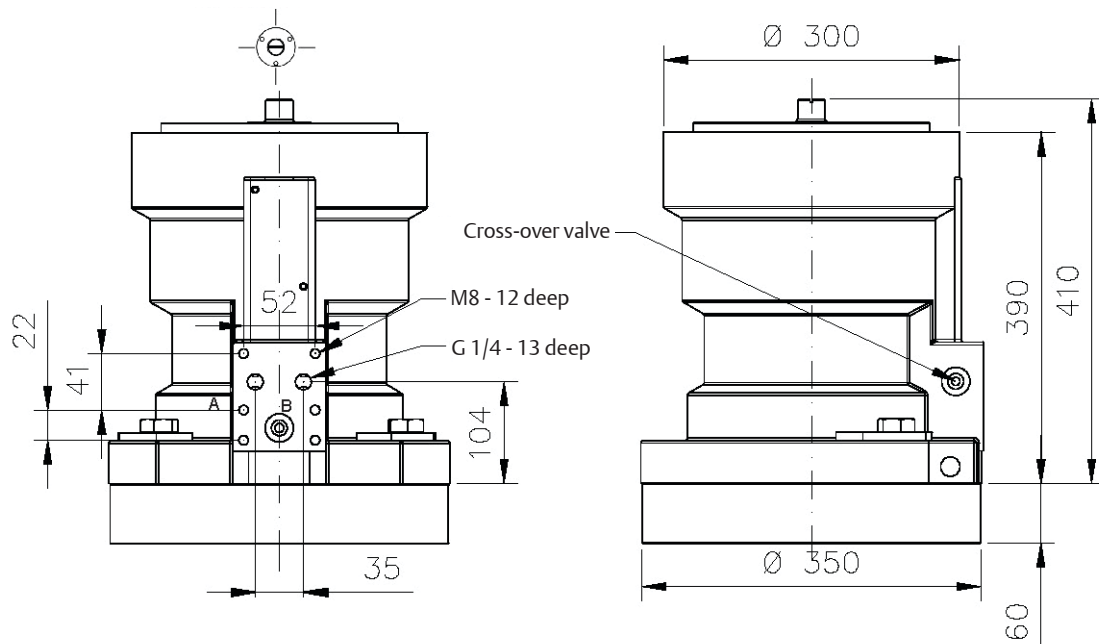
Main Data

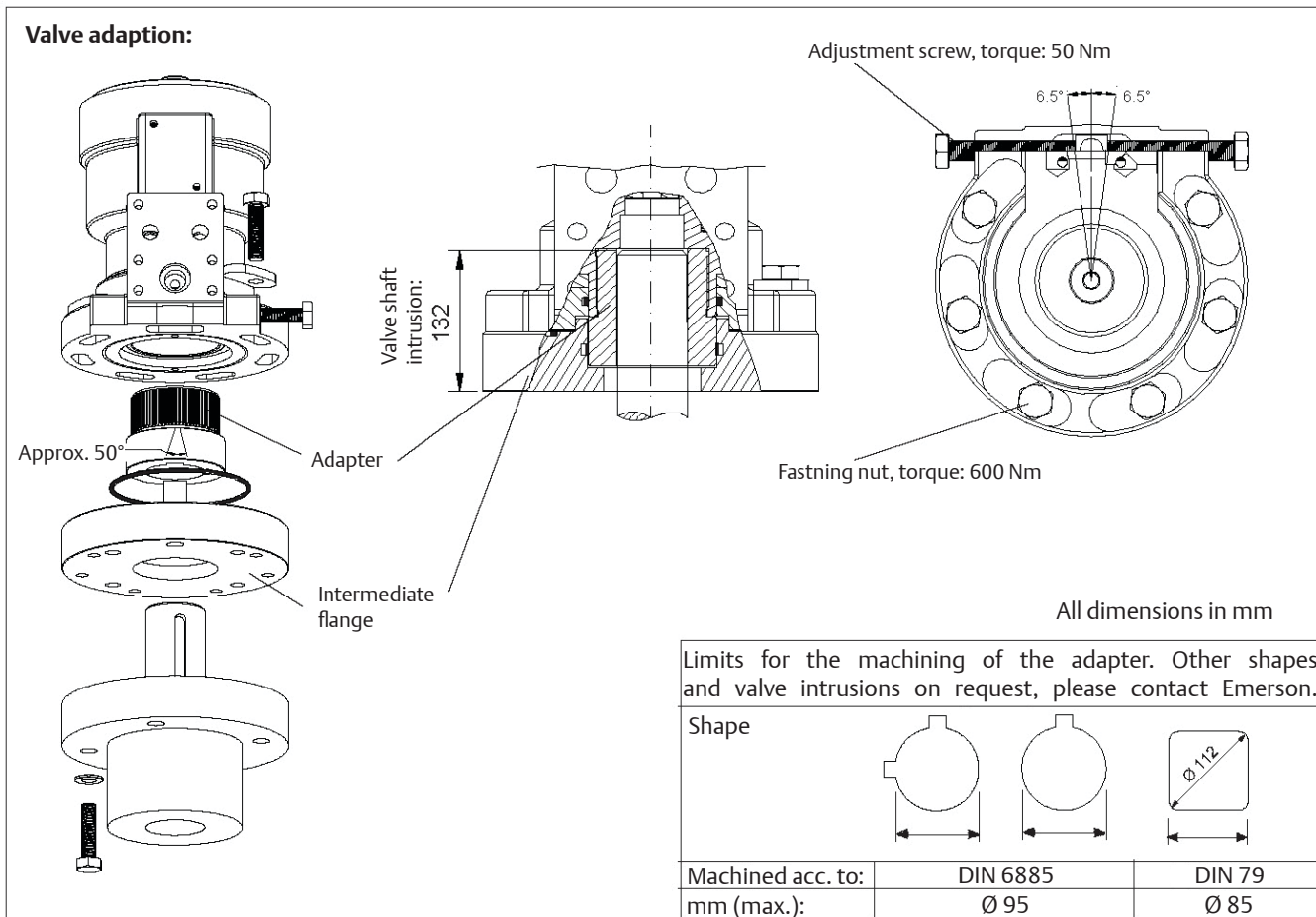
Recommended working pressure range	30 - 135 bar
Burst test	675 bar
Total dry weight including mounting set (46.5 kg)	176 kg
Oil displacement	3.1 l
Temperature range	Normal application: -25 °C to +80 °C (NBR Seal set)
Rotation	90° ±1°
Hydraulic media and viscosities	We recommend acid-free hydraulic oil. Viscosity range: 15 - 200 cSt. For recommended brands and for other media than oil please refer to separate data sheet.

Main Dimensions

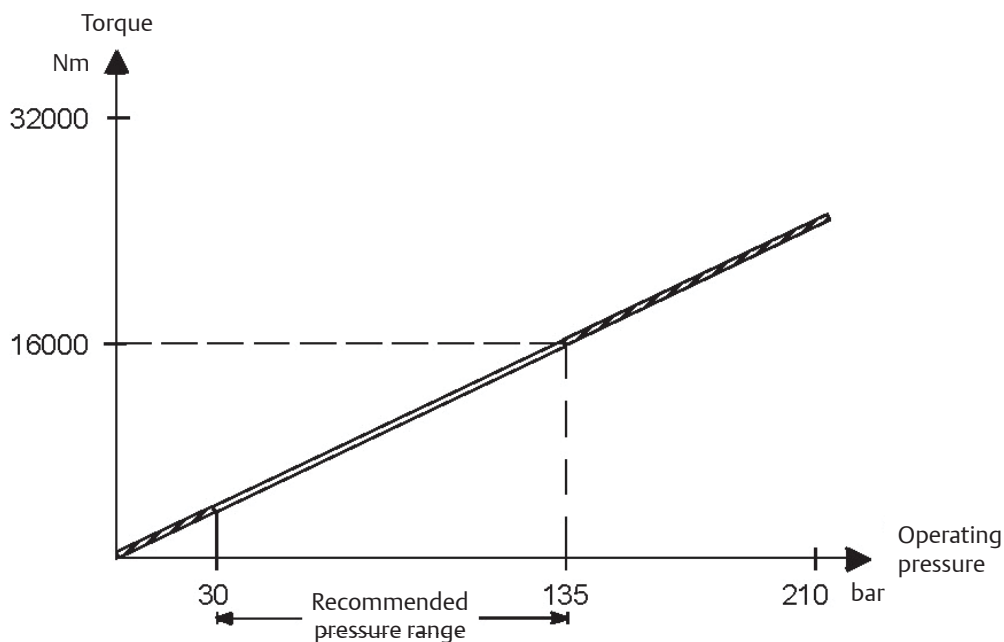
Actuator shown in closed position.
A port: Close (clockwise seen from above),
B port: Open.

All dimensions in mm

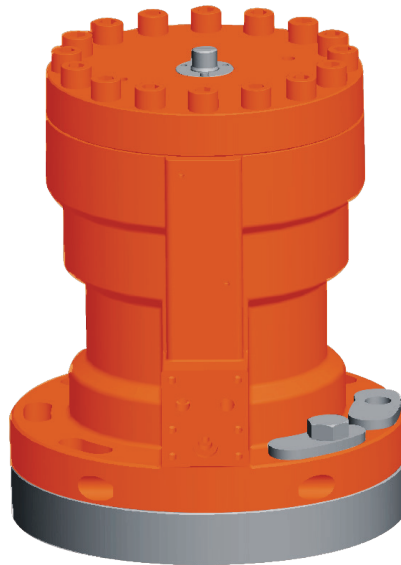




Performance



Bettis BHH 8000



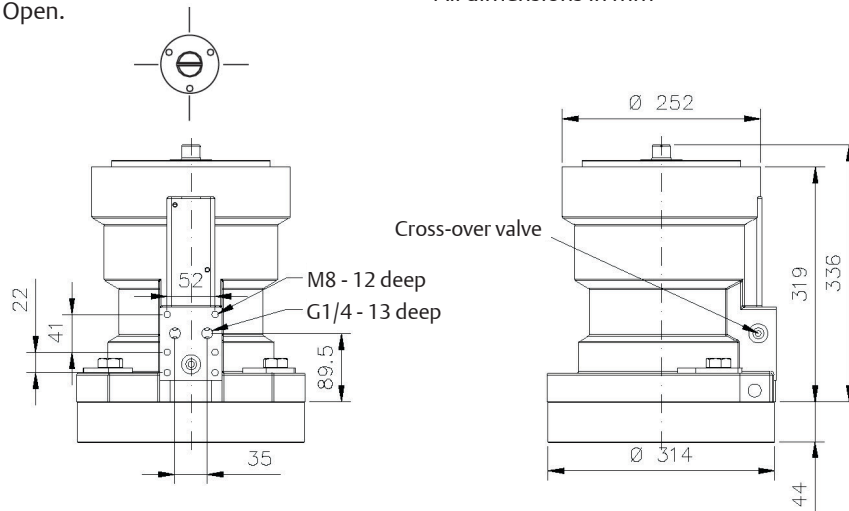
Main Data

Recommended working pressure range	30 - 135 bar
Burst test	675 bar
Total dry weight including mounting set (26.9 kg)	108 kg
Oil displacement	1.6 l
Temperature range	Normal application: -25 °C to +80 °C (NBR Seal set) High temperature application: -20 °C to +120 °C (Viton® Seal set) Low temperature application: -45 °C to +40 °C (T.L.T. NITRIL Seal set)
Rotation	90° ±1°
Hydraulic media and viscosities	We recommend acid-free hydraulic oil. Viscosity range: 15 - 200 cSt. For recommended brands and for other media than oil please refer to separate data sheet.

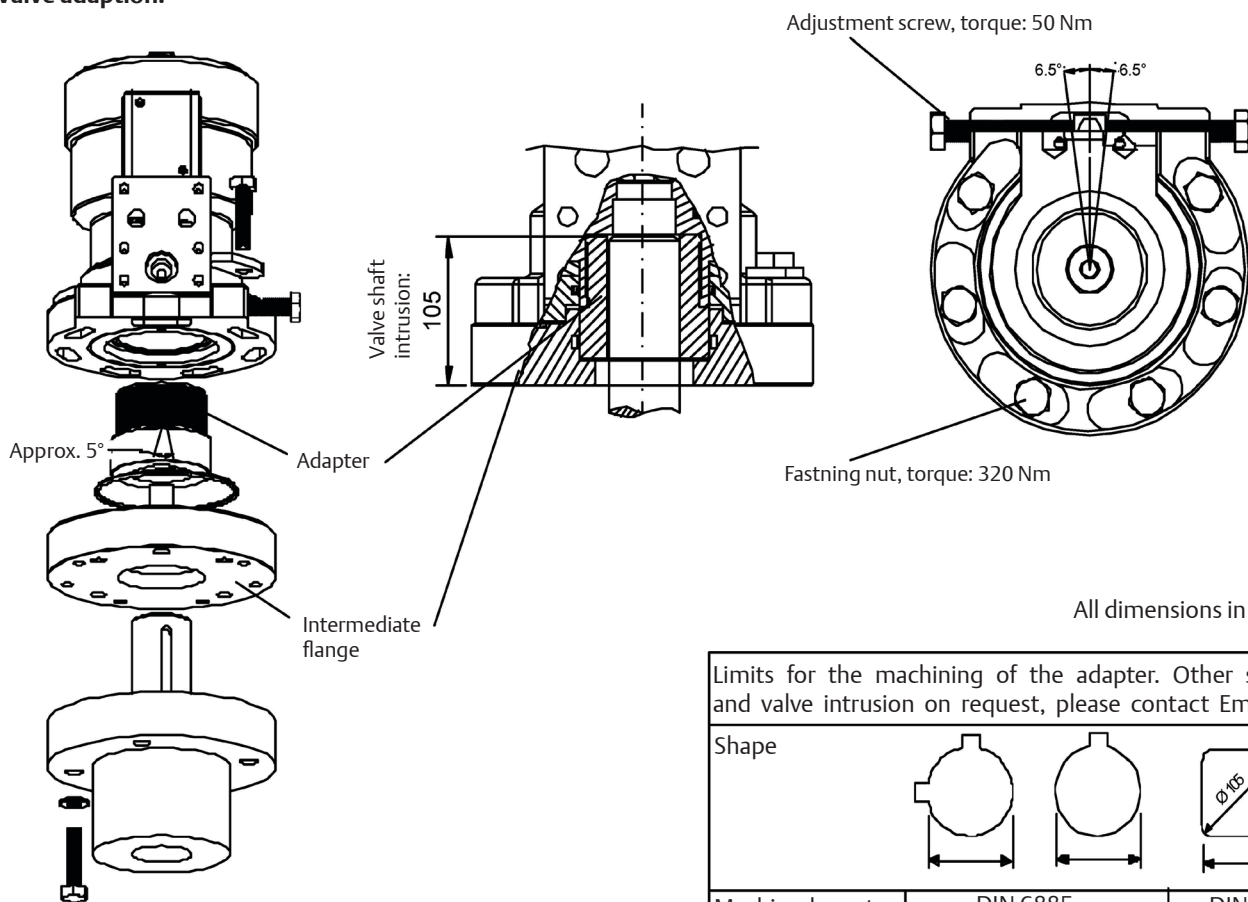
Main Dimensions

Actuator shown in closed position.
A port: Close (clockwise seen from above),
B port: Open.

All dimensions in mm


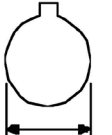



Valve adaption:

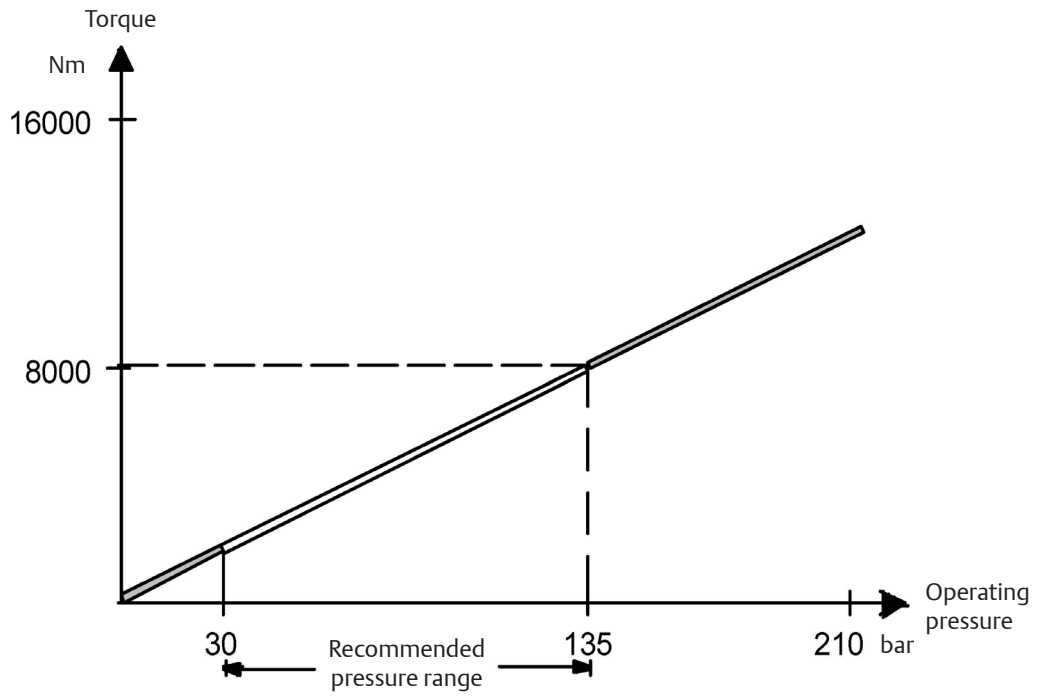


All dimensions in mm

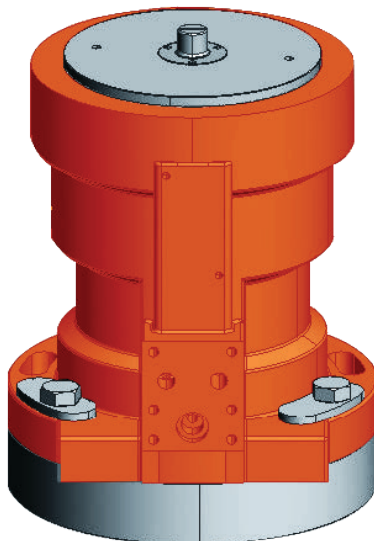
Limits for the machining of the adapter. Other shapes and valve intrusion on request, please contact Emerson.

Shape			
Machined acc. to:	DIN 6885	DIN 6885	DIN 79
mm (max.):	$\varnothing 95$	$\varnothing 95$	$\varnothing 80$

Performance



Bettis BHH 4000



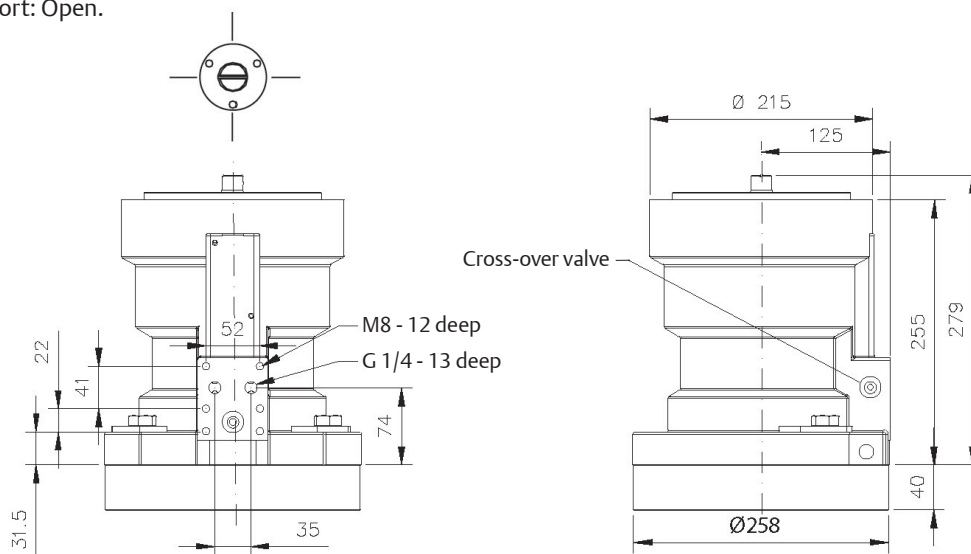
Main Data

Recommended working pressure range	30 - 135 bar
Burst test	675 bar
Total dry weight including mounting set (25.8 kg)	68.9 kg
Oil displacement	0.800 l
Temperature range	Normal application: -25 °C to +80 °C (NBR Seal set) High temperature application: -20 °C to +120 °C (Viton® Seal set) Low temperature application: -45 °C to +40 °C (T.L.T. NITRIL Seal set)
Rotation	90° ±1°
Hydraulic media and viscosities	We recommend acid-free hydraulic oil. Viscosity range: 15 - 200 cSt. For recommended brands and for other media than oil please refer to separate data sheet.

Main Dimensions

Actuator shown in closed position.
A port: Close (clockwise seen from above),
B port: Open.

All dimensions in mm



Valve adaption:

Adjustment screw, torque: 50 Nm

Valve shaft intrusion: 85

Approx. 5°

Adapter

Intermediate flange

Fastning nut, torque: 150 Nm

7.5° 7.5°

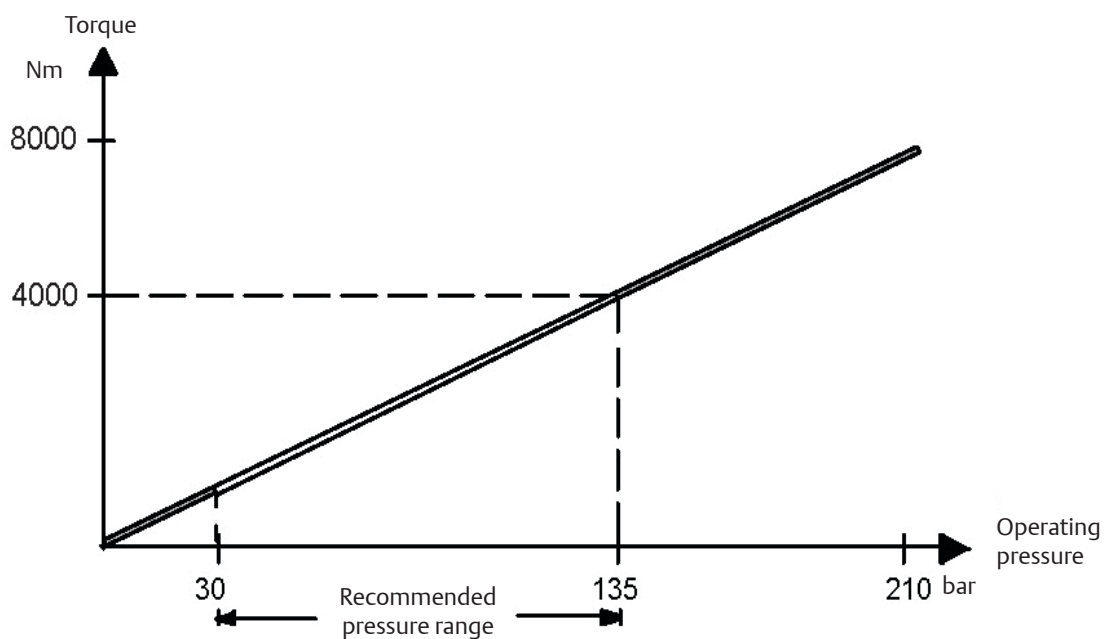
All dimensions in mm

Limits for the machining of the adapter. Other shapes and valve shaft intrusions on request, please contact Emerson.

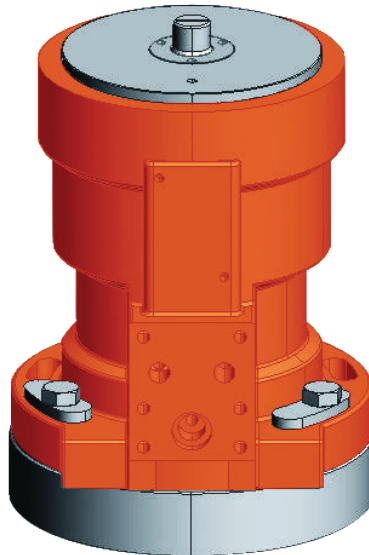
Shape

Machined acc. to:	DIN 6885	DIN 79
mm (max.):	Ø 74	Ø 63

Performance



Bettis BHH 2000



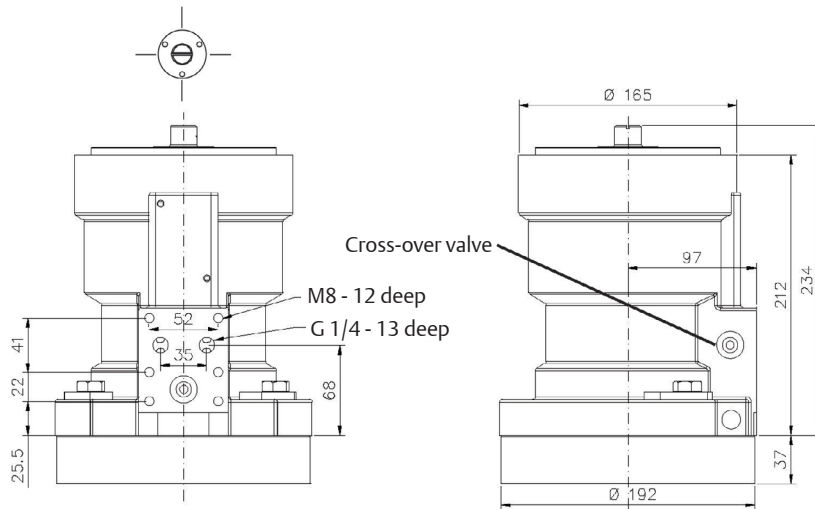
Main Data

Recommended working pressure range	30 - 135 bar
Burst test	675 bar
Total dry weight including mounting set (10.1 kg)	33.1 kg
Oil displacement	0.400 l
Temperature range	Normal application: -25 °C to +80 °C (NBR Seal set) High temperature application: -20 °C to +120 °C (Viton® Seal set) Low temperature application: -45 °C to +40 °C (T.L.T. NITRIL Seal set)
Rotation	90° ±1°
Hydraulic media and viscosities	We recommend acid-free hydraulic oil. Viscosity range: 15 - 200 cSt. For recommended brands and for other media than oil please refer to separate data sheet.

Main Dimensions

Actuator shown in closed position.
A port: Close (clockwise seen from above),
B port: Open.

All dimensions in mm



Valve adaption:

Technical drawings for valve adaption showing exploded view, cross-section, and top view of the adapter assembly:

- Exploded View:** Shows the adapter, intermediate flange, and fastening nut. Labels include: Adapter, Intermediate flange, and Fastening nut, torque: 60 Nm.
- Cross-section:** Shows the valve shaft intrusion: 7.5 mm.
- Top View:** Shows the adapter with an adjustment screw, torque: 50 Nm, and a 7.5° angle. Labels include: Adjustment screw, torque: 50 Nm, and 7.5°.

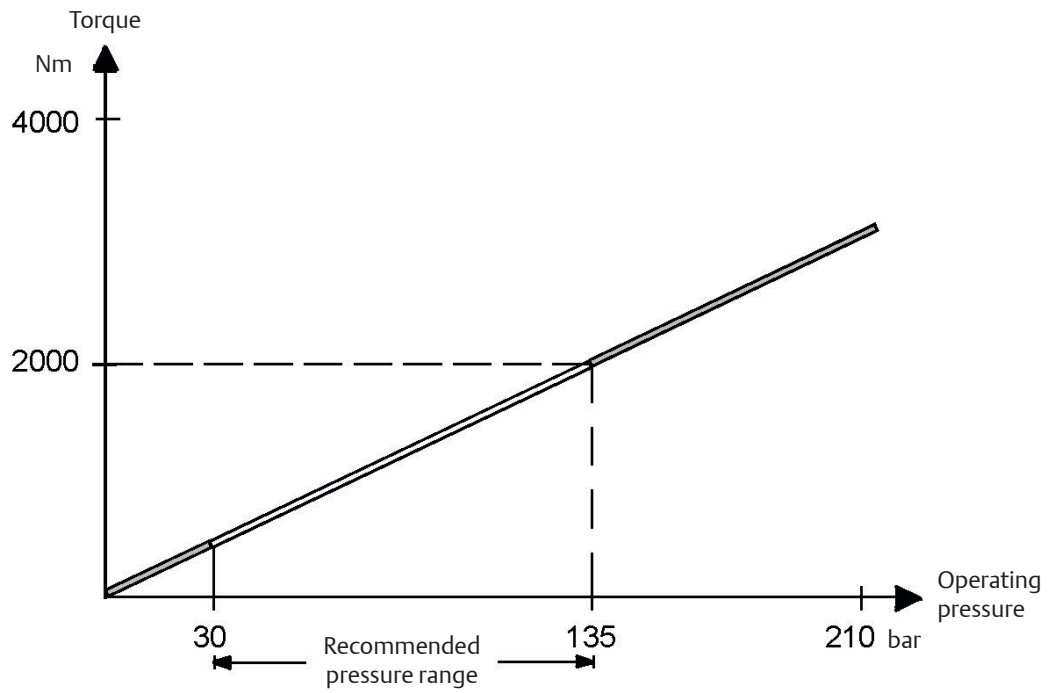
Approx. 5°

All dimensions in mm

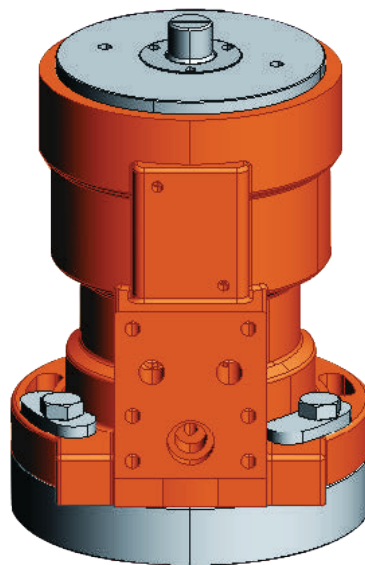
Limits for the machining of the adapter. Other shapes and valve shaft intrusions on request, please contact Emerson.

Shape			
Machined acc. to:	DIN 6885	DIN 79	DIN 79
mm (max.):	Ø 58	Ø 50	Ø 50

Performance



Bettis BHH 1000



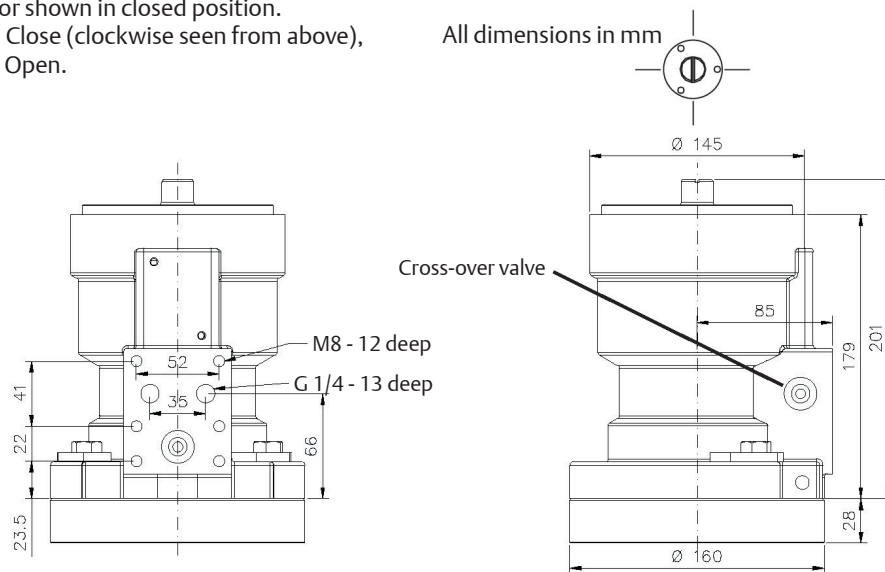
Main Data

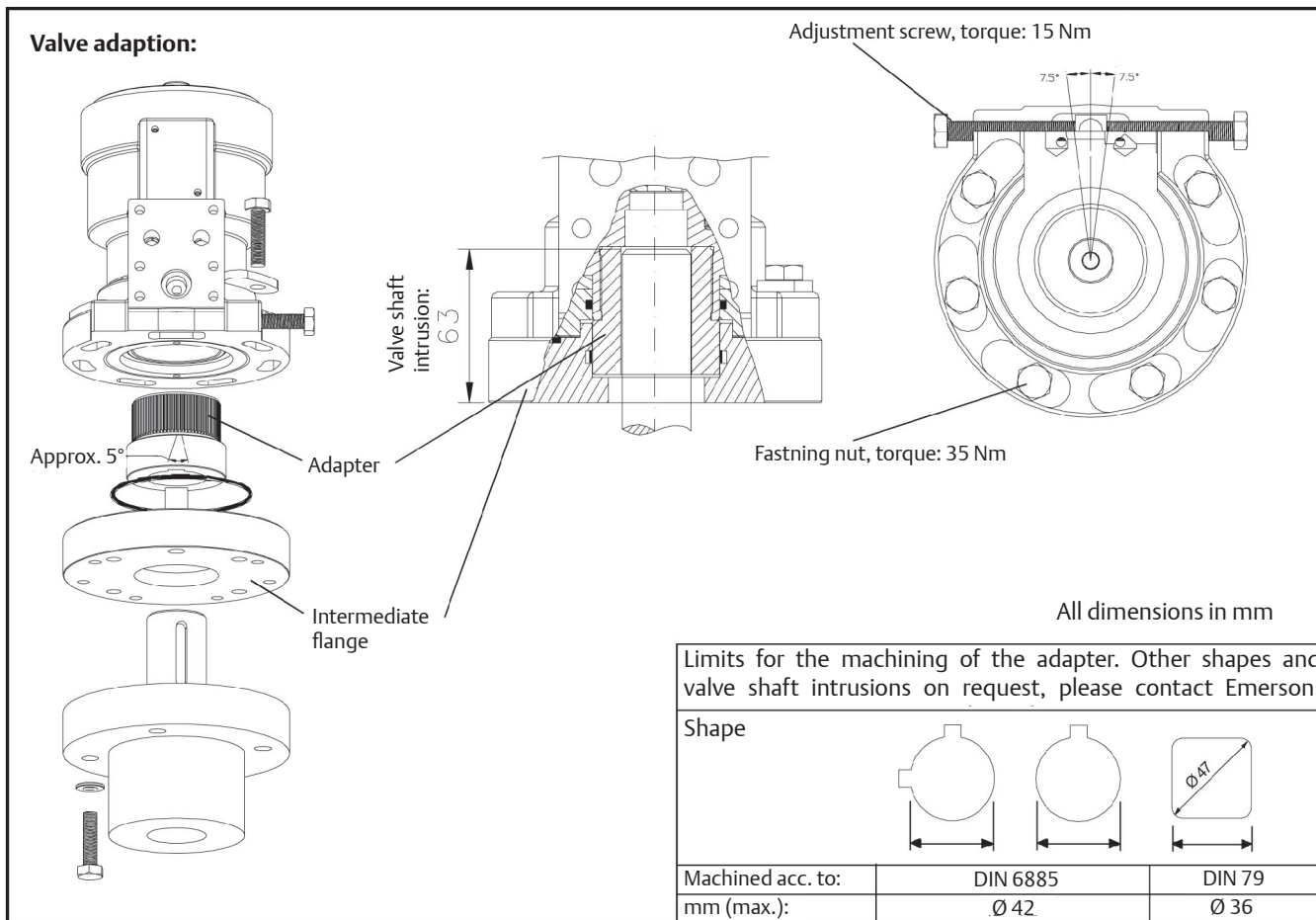
Recommended working pressure range	30 - 135 bar
Burst test	675 bar
Total dry weight including mounting set (5.5 kg)	19.9 kg
Oil displacement	0.209 l
Temperature range	Normal application: -25 °C to +80 °C (NBR Seal set) High temperature application: -20 °C to +120 °C (Viton® Seal set) Low temperature application: -45 °C to +40 °C (T.L.T. NITRIL Seal set)
Rotation	90° ±1°
Hydraulic media and viscosities	We recommend acid-free hydraulic oil. Viscosity range: 15 - 200 cSt. For recommended brands and for other media than oil please refer to separate data sheet.

Main Dimensions

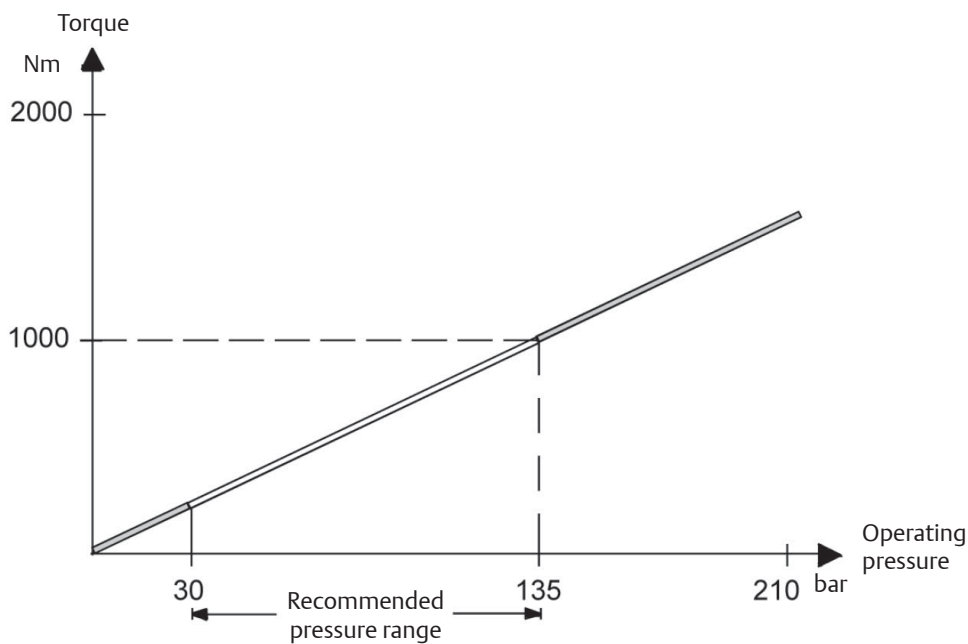
Actuator shown in closed position.
A port: Close (clockwise seen from above),
B port: Open.

All dimensions in mm

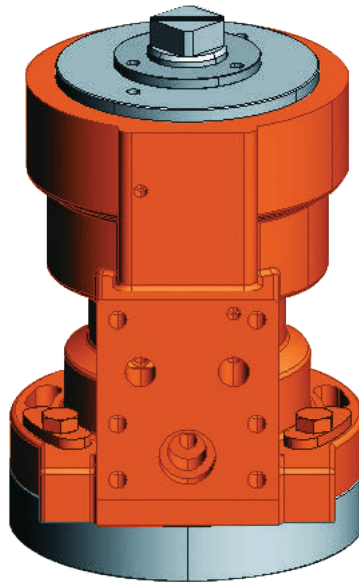




Performance



Bettis BHH 500



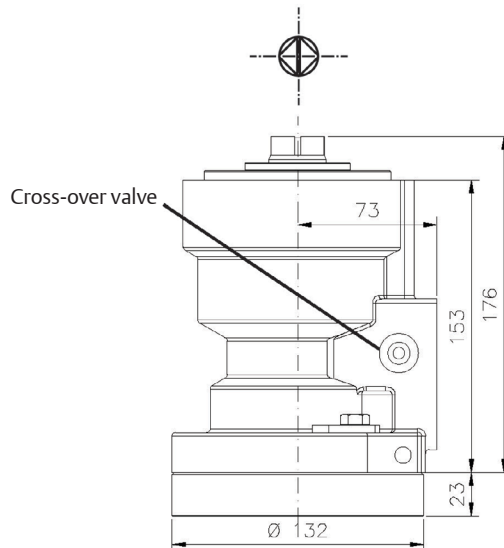
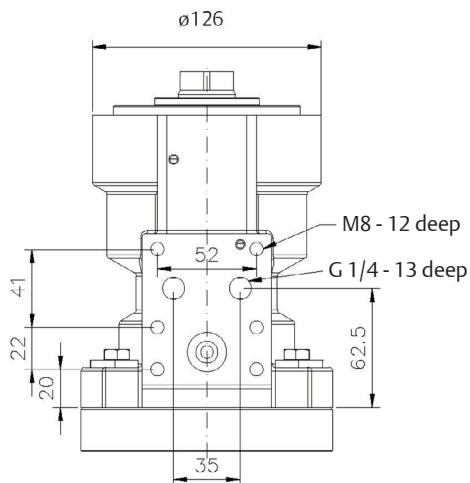
Main Data

Recommended working pressure range	30 - 135 bar
Burst test	675 bar
Total dry weight including mounting set (3.1 kg)	13.0 kg
Oil displacement	0.102 l
Temperature range	Normal application: -25 °C to +80 °C (NBR Seal set) High temperature application: -20 °C to +120 °C (Viton® Seal set) Low temperature application: -45 °C to +40 °C (T.L.T. NITRIL Seal set)
Rotation	90° ±1°
Hydraulic media and viscosities	We recommend acid-free hydraulic oil. Viscosity range: 15 - 200 cSt. For recommended brands and for other media than oil please refer to separate data sheet.

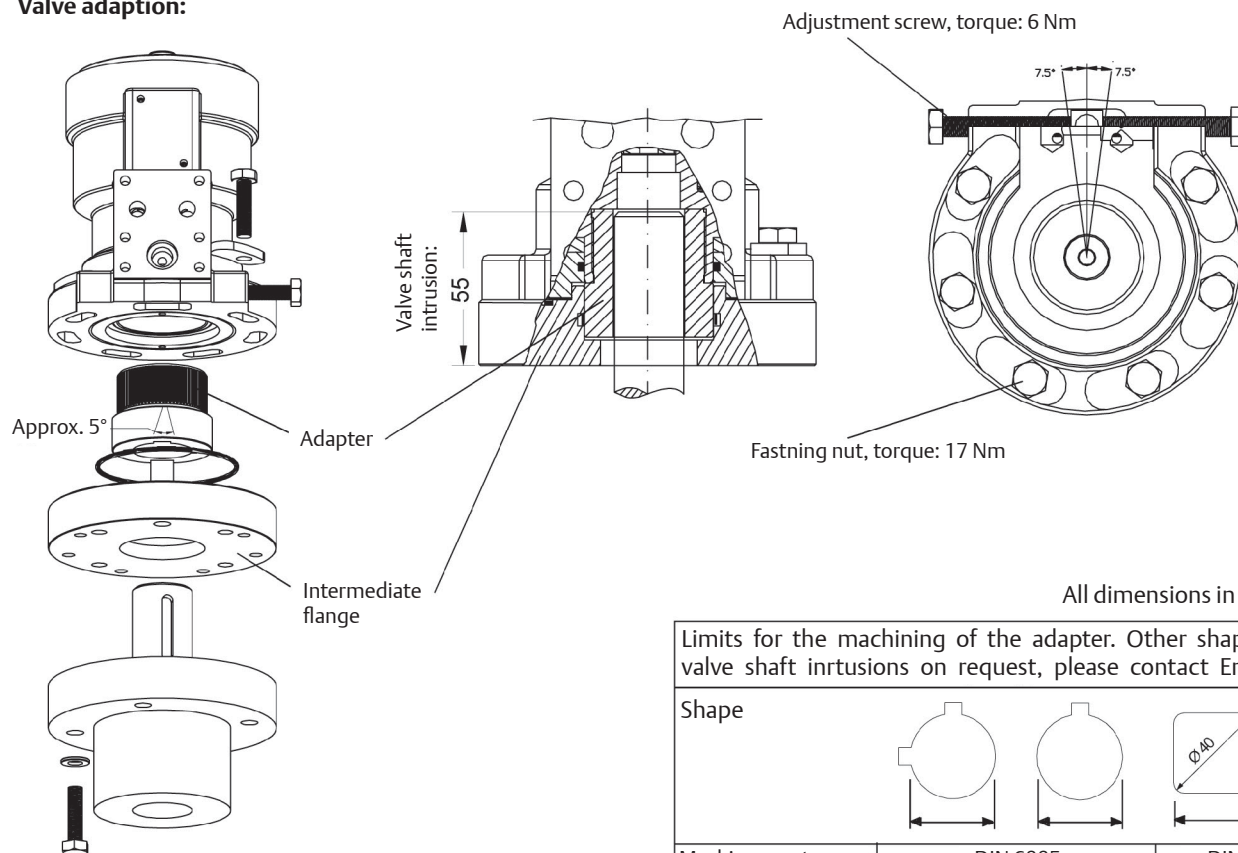
Main Dimensions

Actuator shown in closed position.
A port: Close (clockwise seen from above),
B port: Open.

All dimensions in mm


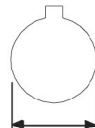
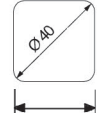


Valve adaption:

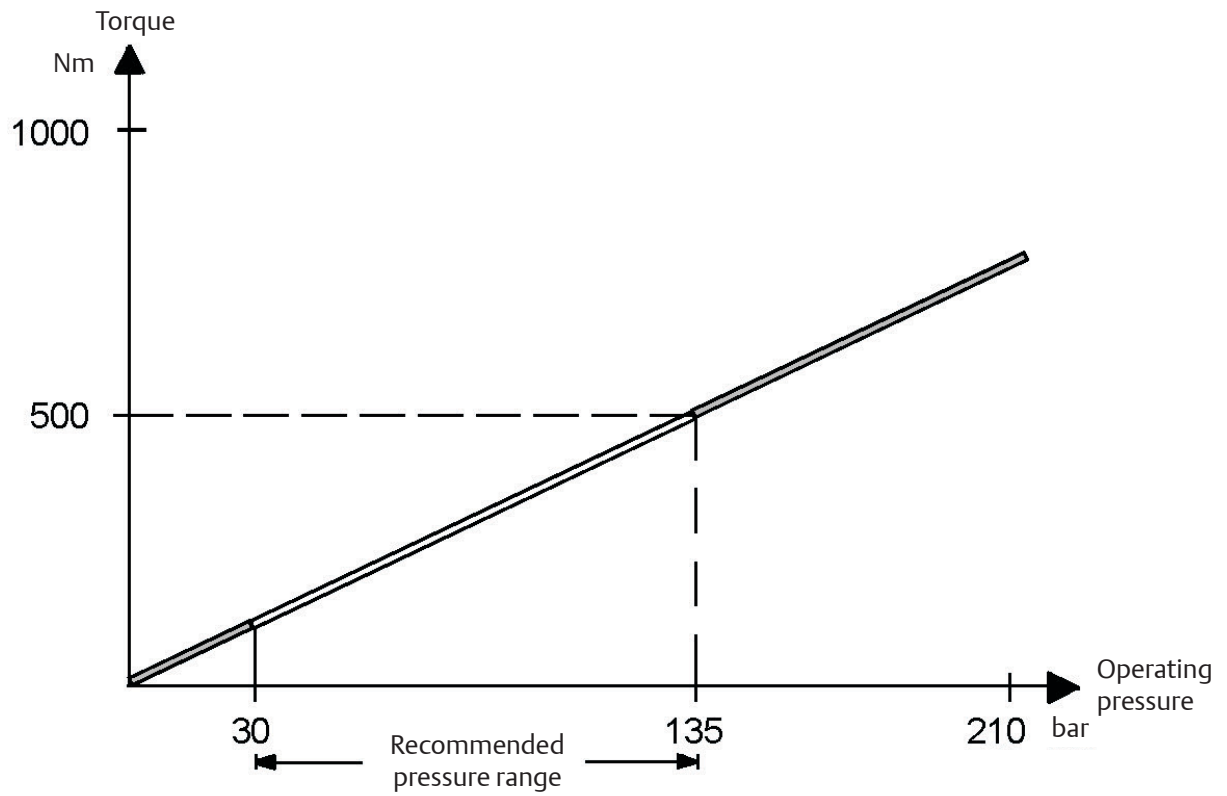


All dimensions in mm

Limits for the machining of the adapter. Other shapes and valve shaft intrusions on request, please contact Emerson.

Shape			
Machine acc. to:	DIN 6885	DIN 79	
mm (max.):	Ø 35	Ø 30	

Performance



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