

VKF1x Series

VKF1x.xxx Butterfly Valves



VKF1x.xxx

ISO 9001 and 14000
REGISTERED FIRM



EAC Conformity (Eurasian Conformity)



UKCA conformity mark (UK)



ISO 9001:2015
ISO 14001:2015
OHSAS 18001:2007



China RoHS
Hazardous substances table:
<http://www.siemens.com/download?A6V10883536>

Description

VKF1x butterfly valves control the flow of many common gases including air, natural gas, propane, butane, biogas, or FGR.

Features

- Available in swing thru or beveled disk versions
 - Full port or reduced port mounting options
 - 1-1/4" [DN32] through 8" [DN200] valves available
 - Mounts between ANSI #125/#150 or ISO 7005-2 (PN10/PN16) flanges
 - Accommodates flow in either direction
 - Valve disk position indication
 - Suitable for air, natural gas, propane, butane, or FGR
 - Suitable for dry biogas within composition limits
 - Maximum media temperature of 356°F [180°C]
 - Includes coupling for 10mm D actuator shaft
 - Includes bracket for SQM33, SQM40, and SQM45 actuators
 - Valve actuator assemblies available (see Technical Instructions VA-3100)
-

Application

VKF1x butterfly valves control the flow of air, natural gas, propane, butane, biogas, or FGR. Valves are positioned using a rotary actuator.



CAUTION: Valves are not to be used as safety shutoff valves. Valves are designed for throttling service only.

Mounting notes

- Ensure that the relevant safety regulations are complied with
- Mount between flanges conforming to ANSI #125/#150 or ISO 7005-2 (PN10/PN16)
- Butterfly valve and actuator can be assembled on site
- No special tools or adjustment required
- The butterfly valve can accommodate flow in either direction (preferred flow direction according to arrow)
- Use flange gaskets that are suitable for the type of gas being used
- Valve opens in the clockwise direction when valve stem is pointing at the observer
- The VKF1x butterfly valves require no maintenance

Mounting flange notes

- When using the valve as a full port valve, any common flange type (butt-weld, slip-on, threaded, etc.) may be used.
- When using the valve as a reduced port valve, consideration should be given to the type of flanges being used. Butt-weld flanges will provide the largest overlap between the sealing surfaces on the valve body and the flanges.
 - **When using a 6" VKF1x.150 valve with 8" flanges, only butt-weld flanges may be used! In addition, 6" full-face gaskets with bolt holes must be used instead of 8" gaskets. The mounting bolts will not pass through the bolt holes in the gasket.**

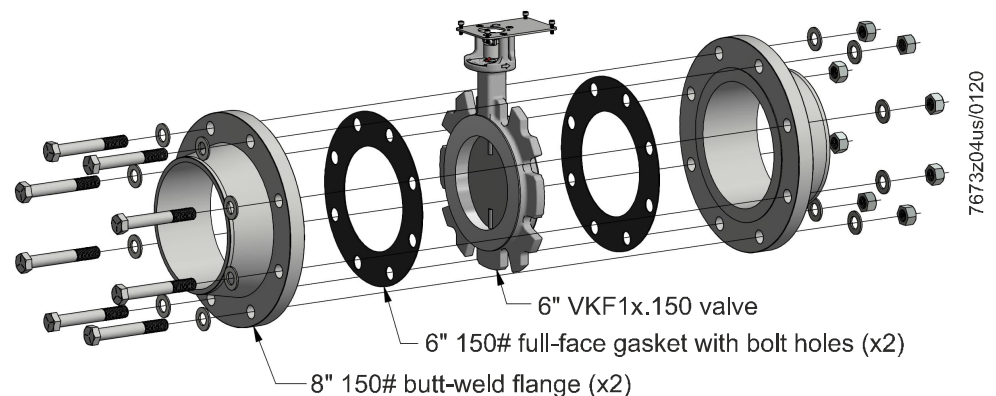


Figure 1. Mounting a 6" VKF1x.150 Valve in a Reduced Port Application

- For all other sizes as a reduced port valve, threaded flanges or slip-on flanges may be used if the valve is properly centered between the flanges.

Part numbers**Table 1. VKF1x.xxx Part Numbers**

| Part Number | Valve Type | Port Diameter (inch [mm]) | Max Operating Pressure | Temperature Range | ANSI #125/#150 Flange Compatibility ² | | Fully Closed Leakage (DP = 2"wc [0.5 kPa]) |
|-------------|--------------|---------------------------|------------------------|--|--|--------|--|
| | | | | | | | |
| VKF10.032 | Swing Thru | 1.26 [32] | 21.8 psig [1.5 bar] | 5 to 356°F ¹ [-15 to 180°C] | 1-1/4" | 1-1/2" | Less than 2.0% of full open flow |
| VKF10.040 | | 1.57 [40] | | | 1-1/2" | 2" | |
| VKF10.050 | | 1.97 [50] | | | 2" | 2-1/2" | |
| VKF10.065 | | 2.56 [65] | | | 2-1/2" | 3" | |
| VKF10.080 | | 3.15 [80] | | | 3" | 4" | |
| VKF10.100 | | 3.94 [100] | 4" | | 5" | | |
| VKF10.125 | | 14.5 psig [1 bar] | 4.92 [125] | | 5" | 6" | |
| VKF10.150 | | | 5.91 [150] | | 6" | 8" | |
| VKF10.200 | | | 7.87 [200] | | 8" | | |
| | | | | | | | |
| VKF11.032 | Beveled Disk | 1.26 [32] | 21.8 psig [1.5 bar] | 5 to 356°F ¹ [-15 to 180°C] | 1-1/4" | 1-1/2" | Less than 0.5% of full open flow |
| VKF11.040 | | 1.57 [40] | | | 1-1/2" | 2" | |
| VKF11.050 | | 1.97 [50] | | | 2" | 2-1/2" | |
| VKF11.065 | | 2.56 [65] | | | 2-1/2" | 3" | |
| VKF11.080 | | 3.15 [80] | | | 3" | 4" | |
| VKF11.100 | | 3.94 [100] | 4" | | 5" | | |
| VKF11.125 | | 14.5 psig [1 bar] | 4.92 [125] | | 5" | 6" | |
| VKF11.150 | | | 5.91 [150] | | 6" | 8" | |
| VKF11.200 | | | 7.87 [200] | | 8" | | |
| | | | | | | | |

¹ For gas service (natural gas, propane, etc.), the temperature range is 5 to 140°F [-15 to 60°C].

² See Mounting Flange Notes on page 2 for important information on flange compatibility.

Table 2. Fitment of Full Port and Reduced Port Valves

| ANSI #125/#150 Flange Size | Swing Thru | | Beveled Disk | |
|----------------------------|------------|------------------------|--------------|------------------------|
| | Full Port | Reduced Port | Full Port | Reduced Port |
| 1-1/4" | VKF10.032 | X | VKF11.032 | X |
| 1-1/2" | VKF10.040 | VKF10.032 | VKF11.040 | VKF11.032 |
| 2" | VKF10.050 | VKF10.040 | VKF11.050 | VKF11.040 |
| 2-1/2" | VKF10.065 | VKF10.050 | VKF11.065 | VKF11.050 |
| 3" | VKF10.080 | VKF10.065 | VKF11.080 | VKF11.065 |
| 4" | VKF10.100 | VKF10.080 | VKF11.100 | VKF11.080 |
| 5" | VKF10.125 | VKF10.100 | VKF11.125 | VKF11.100 |
| 6" | VKF10.150 | VKF10.125 | VKF11.150 | VKF11.125 |
| 8" | VKF10.200 | VKF10.150 ¹ | VKF11.200 | VKF11.150 ¹ |

¹ 8" butt-weld flanges and 6" full-face gaskets with bolt holes must be used when fitting a 6" valve between two 8" flanges. See "Mounting flange notes" on page 2

| | |
|-------------------------|--|
| Features | The valve disk does not close against an end stop. |
| VKF10.xxx models | After mounting the actuator, the position indicator and valve disk are both at 5°. |
| VKF11.xxx models | The valve disk closes against an end stop (approx. 5° position). |

| | |
|-----------------------------|--|
| Ordering information | The butterfly valve and actuator are ordered as individual items. |
| | <i>Example:</i> |
| | 1 VKF10.100 butterfly valve |
| | 1 SQM40.255R11 actuator |
| | VAX assemblies include the actuator mounted to the VKF1x butterfly valve and are tested and shipped as a single component. See Technical Instructions VA-3100. |

Accessories

SQM33



Actuator
 (to be ordered separately)

Refer to data sheet N7813

SQM40.xx5xxx



Actuator
 (to be ordered separately)

Refer to data sheet N7817

SQM45.295B9



Actuator
 (to be ordered separately)

Refer to data sheet N7814

ASK33.1



SQM33, SQM40, SQM45 mounting bracket
 (included with each VKF1x valve – does not
 need to be ordered separately!)

- Screws are provided to mount the actuator to the ASK33.1 bracket

SQM5x.xx5xxxx

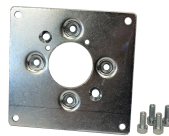


Actuator
 (to be ordered separately)

- Only SQM5 actuators with the 10mm D shaft may be used with the VKF1x butterfly valves!

Refer to data sheet N7815

ASK33.3



SQM5 mounting bracket
 (to be ordered separately)

- Discard standard mounting bracket ASK33.1
- Screws are provided to mount the SQM5 actuator to the ASK33.3 bracket

Accessories, continued

SQN7x.xxxxx1



Actuator
(to be ordered separately)

Refer to data sheets N7802
and N7804

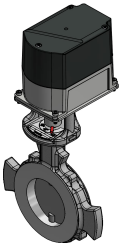
ASK33.5



SQN7 mounting bracket and reducing
sleeve
(to be ordered separately)

- Discard standard mounting bracket ASK33.1
- Screws are provided to mount the SQN7 actuator to the ASK33.5 bracket

VAx

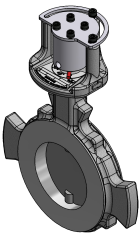


Valve actuator assemblies

- Includes the valve, coupling, bracket, and actuator and is shipped as a complete assembly

Refer to Technical Instructions VA-3100

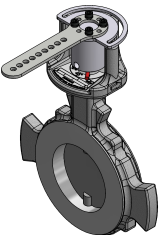
VKF1X-MH



A manual kit that can be added to any VKF1 butterfly valve for use as a manual flow restrictor. The kit includes brackets and fasteners to lock the valve in any position.

Add “-MH” to the end of any VKF1 valve part number to have the valve shipped with the manual kit attached.

CA-VKF1X...



Three crank arm kits are available that can be added to any VKF1 butterfly valve. Holes or a slot in the crank arm allow users to connect a linkage (by others) to control valve position.

CA-VKF1X-1 – Crank arm kit with thick crank arm with holes

Add “-CA1” at the end of any VKF1 valve part number to have the valve shipped with crank arm kit CA-VKF1X-1 attached.

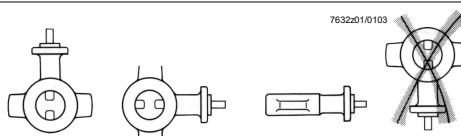
CA-VKF1X-2 – Crank arm kit with standard crank arm with holes

Add “-CA2” at the end of any VKF1 valve part number have the valve shipped with crank arm kit CA-VKF1X-2 attached.

CA-VKF1X-3 – Crank arm kit with standard crank arm with slot

Add “-CA3” at the end of any VKF1 valve part number to have the valve shipped with crank arm kit CA-VKF1X-3 attached.

Refer to Dimensions section for more details.

| | | | |
|---------------------------------------|--|---|--|
| Specifications | Agency approvals/standards | Applicable regulations: Gas Appliances Regulation | (EU)2016/426 |
| Approvals | | Compliance with the regulations of the applied directives is verified by the adherence to the following standards/regulations: Safety and control devices for burners and appliances burning gaseous and/or liquid fuels – General requirements DIN EN 13611 Safety and control devices for gas burners and gas-burning appliances – General requirements ISO 23550 | |
| Storage environment | EN 60721-3-1:1997 Climatic conditions Mechanical conditions Temperature range Humidity | Class 1K3 Class 1M2 -4 to 140°F [-20 to 60°C] < 95% r.h. | |
| Operating environment | EN 60721-3-3:1995 + A2:1997 Climatic conditions Mechanical conditions Temperature range Humidity | Class 3K5 Class 3M2 5 to 356°F [-15 to 180°C] (air and flue gas) 5 to 140°F [-15 to 60°C] (gas) < 95% r.h. | |
| Transport environment | EN 60721-3-2:1997 Climatic conditions Mechanical conditions Temperature range Humidity | Class 2K2 Class 2M2 -4 to 140°F [-20 to 60°C] < 95% r.h. | |
| Permissible mounting positions |  | | |
| Operating pressure | <ul style="list-style-type: none"> Sizes up to and including 4" [DN100] Sizes 5" [DN125] to 8" [DN200] | Maximum Pressure | 21.8 psig [1.5 bar] 14.5 psig [1 bar] |
| Types of gases | <ul style="list-style-type: none"> Air Natural gas Propane Butane Dry biogas – maximum concentration 1% H₂S, 1% NH₃ FGR – see temperature limits | | |

Specifications, continued

| | | |
|---------------------------------|--|---|
| Leakage rate | For VKF10/VKF11 – fully closed | See Table 5 |
| Rotation angle | Closed position Open position Operating stroke | 5° 85° 80° |
| | Valve stem rotates clockwise to open the valve – viewed with shaft pointed at observer | |
| | Torque | For low operating pressures (up to 4.4 psig), actuators with up to 27 in-lb can be used. For high operating pressures, the use of actuators with 90 in-lb or more is recommended. |
| Physical characteristics | Body materials: | |
| | <ul style="list-style-type: none"> Valve body | GGG40.3 Cast iron with nodular graphite according to EN 1563 |
| | <ul style="list-style-type: none"> Shaft and valve disk Shaft seal Bearings | Stainless steel Double O-rings High-temp plastic |
| | Weight | Refer to <i>Dimensions</i> |



CAUTION:
 Condensation, formation of ice, and accumulation of water inside the valve are not permitted.
 Failure to observe this information poses a risk of damaging the safety functions.

Flow Data (continued)

Flow rate (SCFH) through the valve body can be estimated using the equation below and the C_v values from Table 3 or 5.

$$Q = 1360 \times C_v \times \left(\sqrt{\frac{P_1 + P_2}{GT_f}} \right) \times \left(\sqrt{\frac{P_1 - P_2}{2}} \right)$$

...where...

C_v = Flow coefficient (see Table 3 or 5)

G = Specific gravity of gas (see Table 6)

P_1 = Absolute inlet pressure in PSIA (PSIG + 14.7)

P_2 = Absolute outlet pressure in PSIA (PSIG + 14.7)

Q = Flow rate in SCFH

T_f = Media temperature in degrees Rankine ($^{\circ}\text{F} + 460$)

Once the flow rate is calculated in SCFH, this value can be multiplied by the Higher Heating Value (HHV) to obtain the heat input for a given flow rate.

Table 6: Gas Properties

| Type of Gas | Specific Gravity (S.G.) | Higher Heating Value (HHV) - BTU/SCF |
|---------------|-------------------------|--------------------------------------|
| Air | 1.00 | - |
| Natural Gas | 0.64 | 1000 |
| Propane | 1.52 | 2500 |
| Butane | 2.00 | 3200 |
| Digester Gas* | 0.84 | 550 |
| FGR** | 1.00 | - |

* The S.G. and HHV can vary widely depending on the gas source.

** The S.G. of FGR can be approximated to be 1.
Compensate for higher temperatures with equation above.

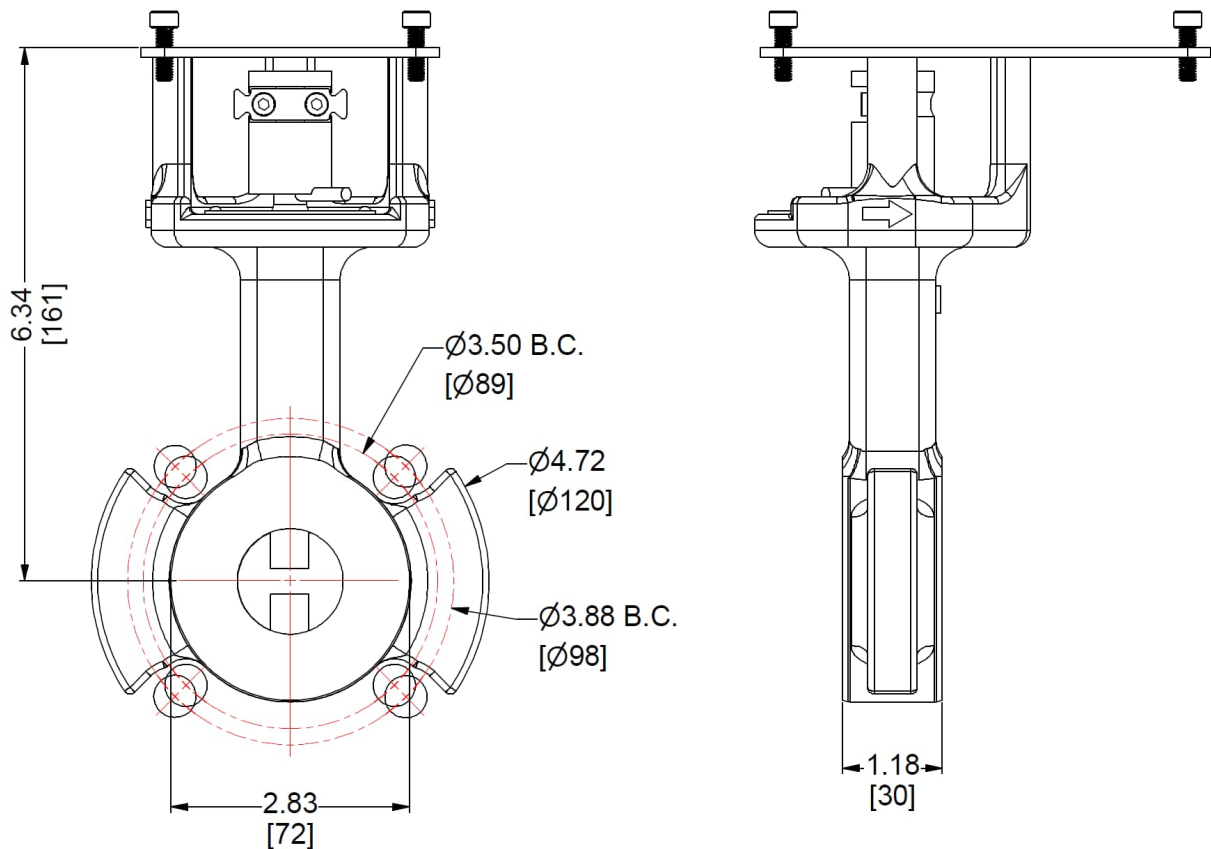
Actuator Torque

Table 7: Torque Required to Operate VKF1x Valves at Various Differential Pressures (in-lb)

| Part Number | Valve Size | Pressure Drop Across Valve (PSI) | | | | | |
|-------------|------------|----------------------------------|---|----|----|-----|----|
| | | 0.5 | 1 | 5 | 10 | 15 | 20 |
| VKF1x.032 | 1-1/4" | 3 | 3 | 5 | 6 | 8 | 9 |
| VKF1x.040 | 1-1/2" | 3 | 3 | 5 | 6 | 8 | 9 |
| VKF1x.050 | 2" | 3 | 3 | 5 | 6 | 8 | 9 |
| VKF1x.065 | 2-1/2" | 3 | 4 | 6 | 8 | 11 | 13 |
| VKF1x.080 | 3" | 3 | 4 | 7 | 10 | 14 | 17 |
| VKF1x.100 | 4" | 3 | 4 | 11 | 19 | 30 | 36 |
| VKF1x.125 | 5" | 3 | 5 | 15 | 27 | 40 | - |
| VKF1x.150 | 6" | 5 | 7 | 22 | 41 | 60 | - |
| VKF1x.200 | 8" | 5 | 9 | 39 | 76 | 114 | - |

Dimensions

Dimensions in inches [mm]

VKF1x.032 – 1-1/4" valve

Weight: 5.1 lb [2.3 kg]

Table 8: Recommended Bolts for Mounting VKF1x.032 Valves between Flanges

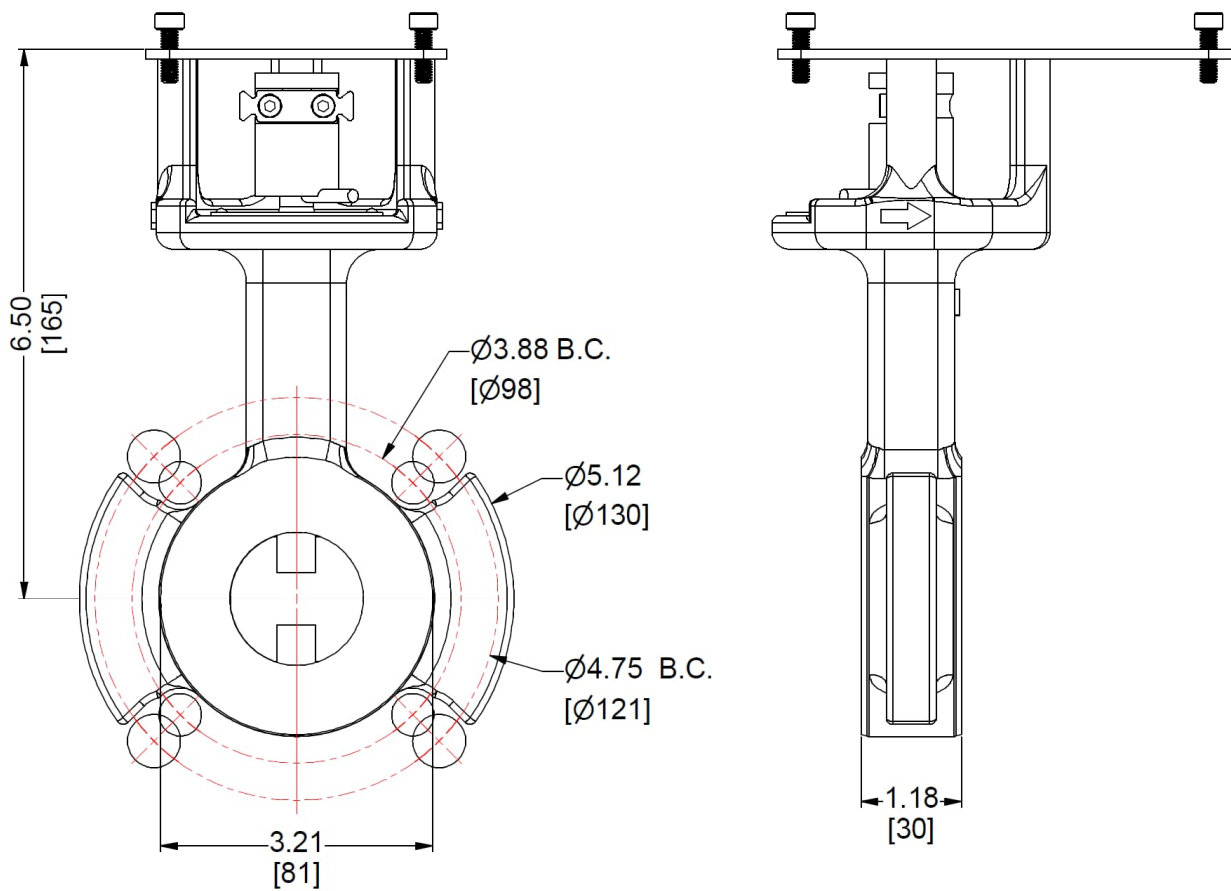
| Flange Size | Application | Nominal Diameter | Length ¹ | Quantity |
|-------------|--------------|------------------|---------------------|----------|
| 1-1/4" | Full port | 1/2" | 3-1/2" | 4 |
| 1-1/2" | Reduced port | 1/2" | 3-3/4" | 4 |

¹ Bolt lengths are calculated assuming the VKF1x valve is being mounted between two 125#/150# ANSI flanges, with two 1/16" thick gaskets, two SAE washers, and one standard hex nut

Dimensions (continued)

Dimensions in inches [mm]

VKF1x.040 – 1-1/2" valve



Weight: 5.5 lb [2.5 kg]

Table 9: Recommended Bolts for Mounting VKF1x.040 Valves between Flanges

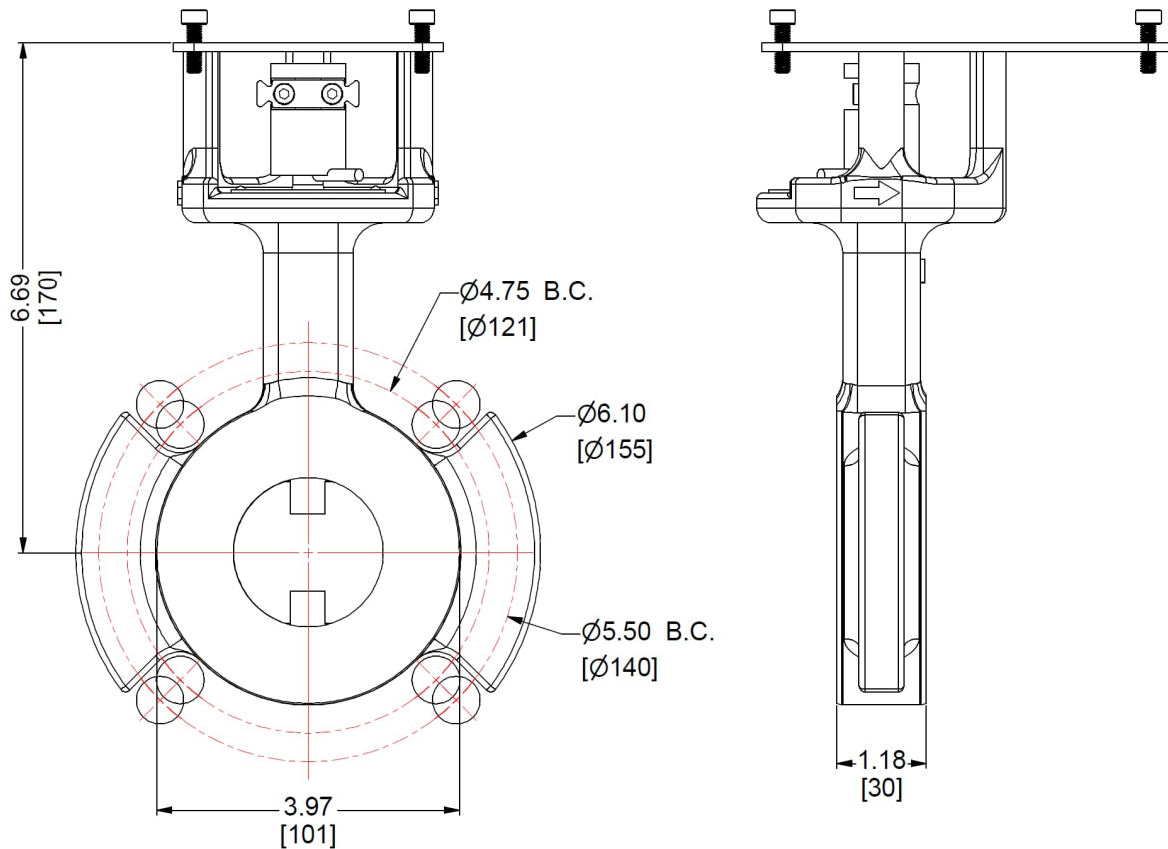
| Flange Size | Application | Nominal Diameter | Length ¹ | Quantity |
|-------------|--------------|------------------|---------------------|----------|
| 1-1/2" | Full port | 1/2" | 3-3/4" | 4 |
| 2" | Reduced port | 5/8" | 4" | 4 |

¹ Bolt lengths are calculated assuming the VKF1x valve is being mounted between two 125#/150# ANSI flanges, with two 1/16" thick gaskets, two SAE washers, and one standard hex nut

Dimensions (continued)

Dimensions in inches [mm]

VKF1x.050 – 2" valve



Weight: 6.4 lb [2.9 kg]

Table 10: Recommended Bolts for Mounting VKF1x.050 Valves between Flanges

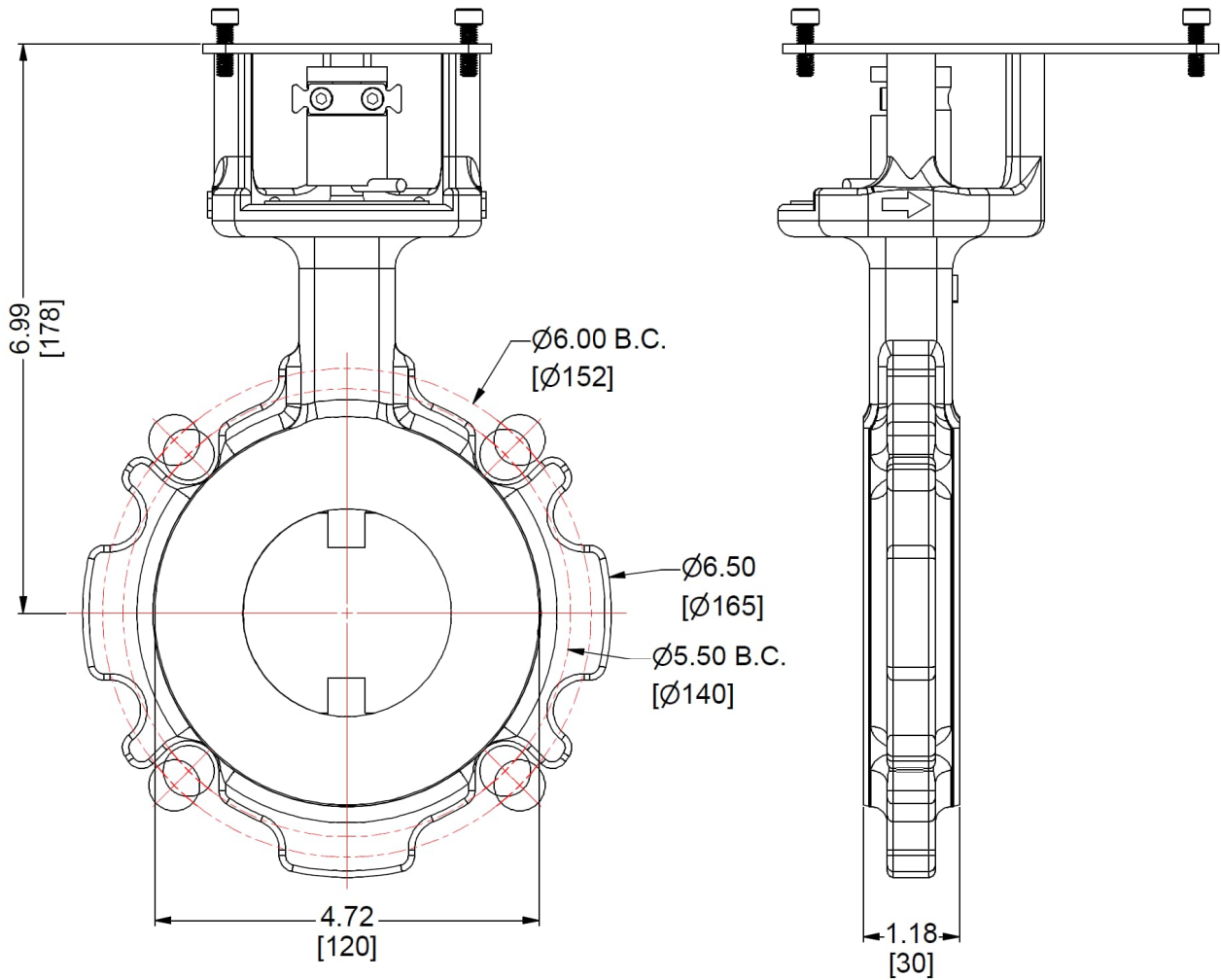
| Flange Size | Application | Nominal Diameter | Length ¹ | Quantity |
|-------------|--------------|------------------|---------------------|----------|
| 2" | Full port | 5/8" | 4" | 4 |
| 2-1/2" | Reduced port | 5/8" | 4-1/4" | 4 |

¹ Bolt lengths are calculated assuming the VKF1x valve is being mounted between two 125#/150# ANSI flanges, with two 1/16" thick gaskets, two SAE washers, and one standard hex nut

Dimensions (continued)

Dimensions in inches [mm]

VKF1x.065 – 2-1/2" valve



Weight: 7.5 lb [3.4 kg]

Table 11: Recommended Bolts for Mounting VKF1x.065 Valves between Flanges

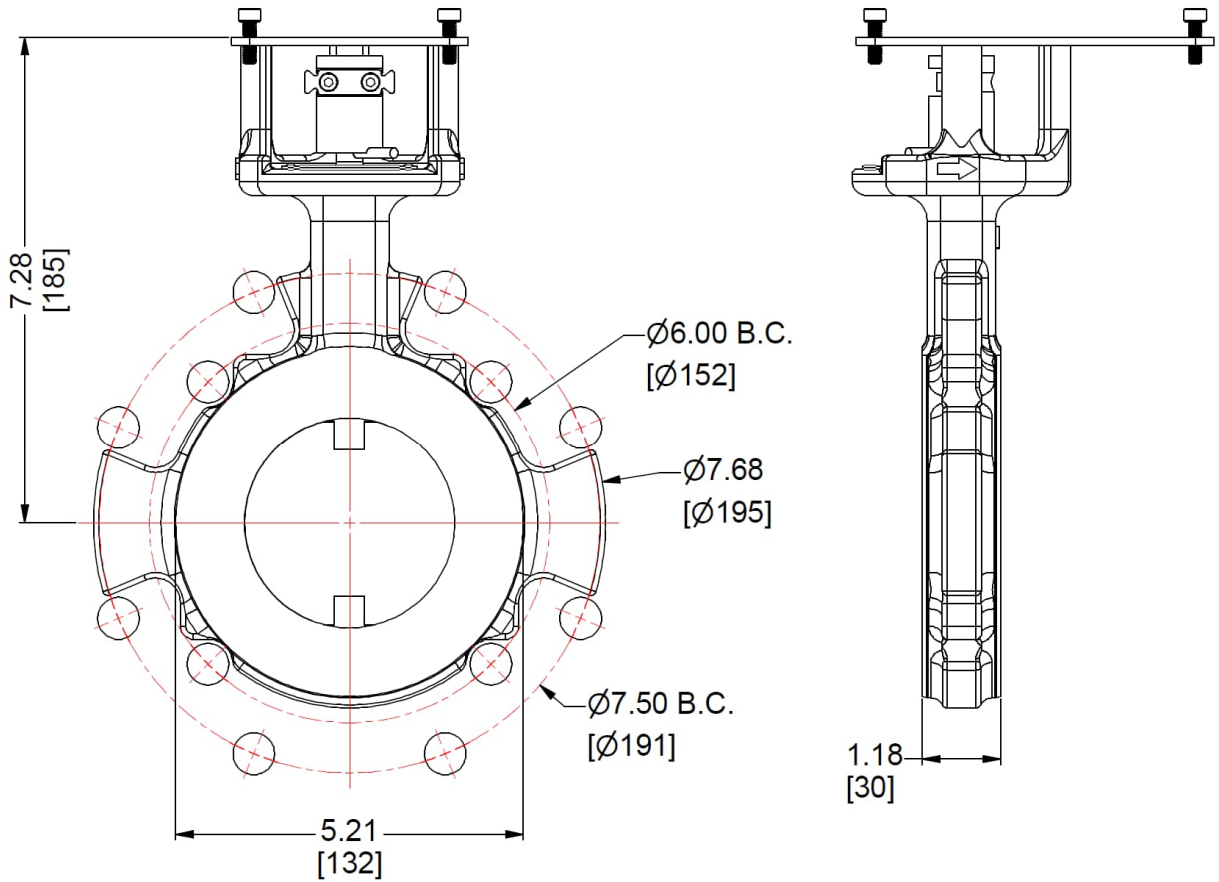
| Flange Size | Application | Nominal Diameter | Length ¹ | Quantity |
|-------------|--------------|------------------|---------------------|----------|
| 2-1/2" | Full port | 5/8" | 4-1/4" | 4 |
| 3" | Reduced port | 5/8" | 4-1/4" | 4 |

¹ Bolt lengths are calculated assuming the VKF1x valve is being mounted between two 125#/150# ANSI flanges, with two 1/16" thick gaskets, two SAE washers, and one standard hex nut

Dimensions (continued)

Dimensions in inches [mm]

VKF1x.080 – 3” valve



Weight: 7.9 lb [3.6 kg]

Table 12: Recommended Bolts for Mounting VKF1x.080 Valves between Flanges

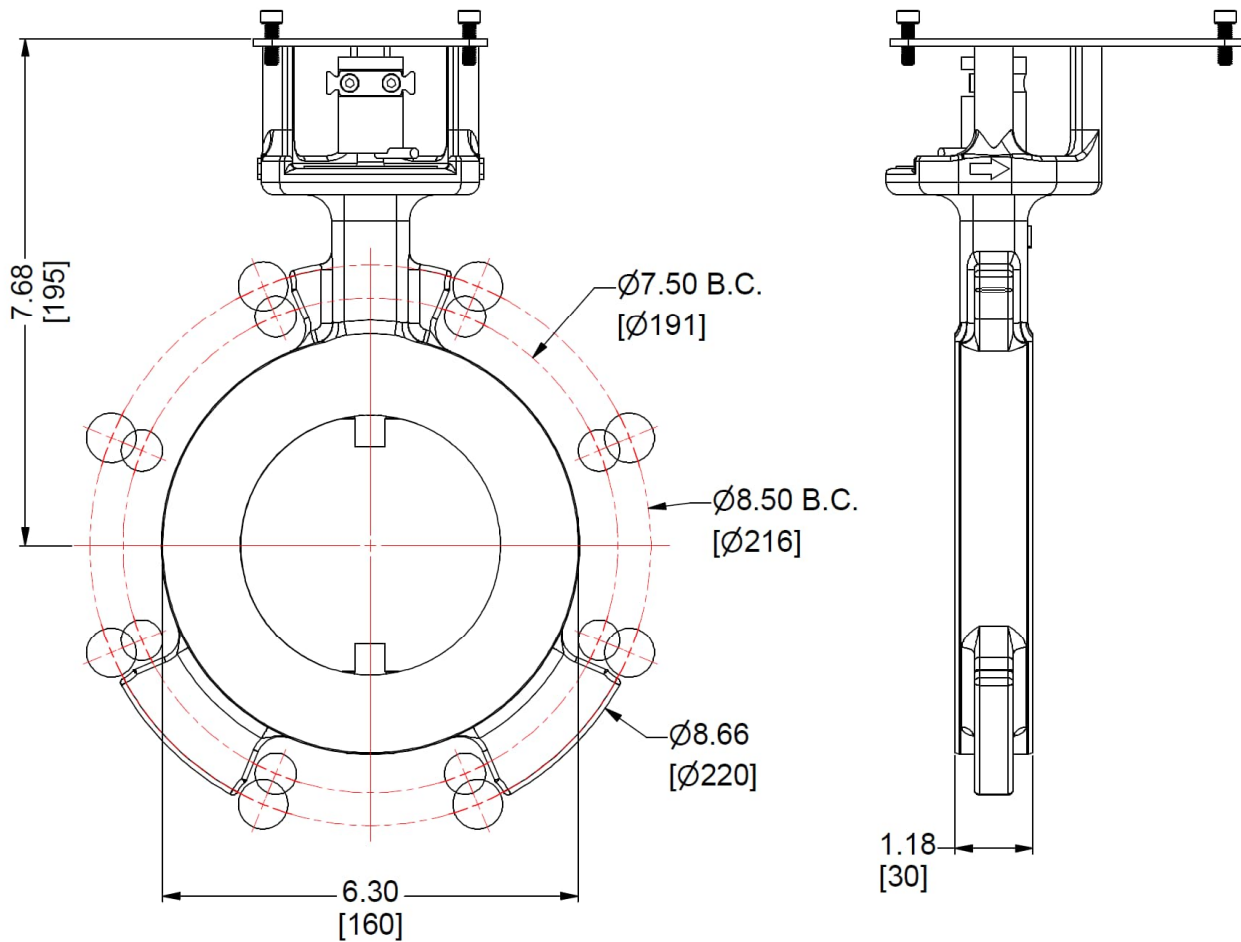
| Flange Size | Application | Nominal Diameter | Length ¹ | Quantity |
|-------------|--------------|------------------|---------------------|----------|
| 3" | Full port | 5/8" | 4-1/4" | 4 |
| 4" | Reduced port | 5/8" | 4-1/4" | 8 |

¹ Bolt lengths are calculated assuming the VKF1x valve is being mounted between two 125#/150# ANSI flanges, with two 1/16" thick gaskets, two SAE washers, and one standard hex nut

Dimensions (continued)

Dimensions in inches [mm]

VKF1x.100 – 4" valve



Weight: 9.5 lb [4.3 kg]

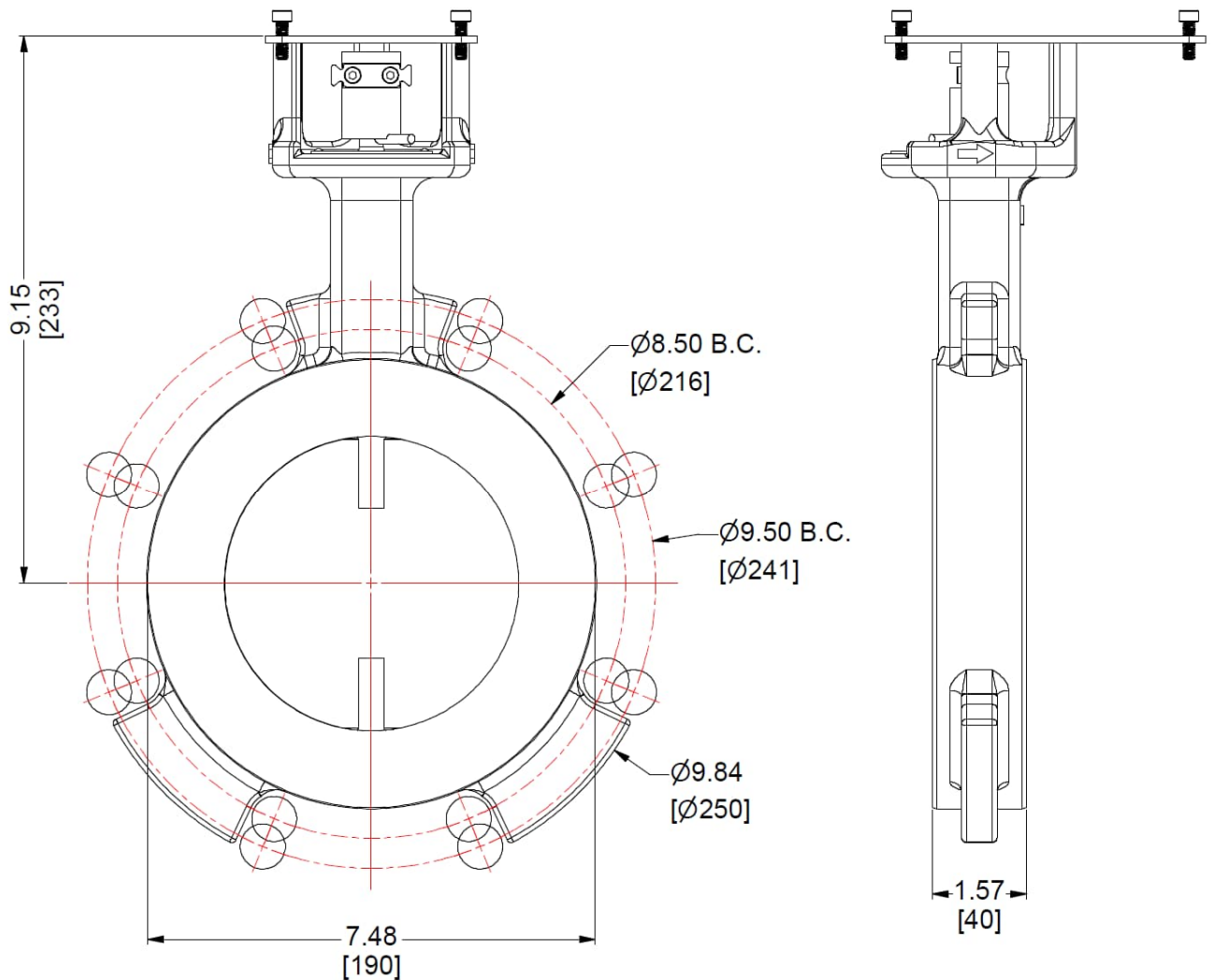
Table 13: Recommended Bolts for Mounting VKF1x.100 Valves between Flanges

| Flange Size | Application | Nominal Diameter | Length ¹ | Quantity |
|-------------|--------------|------------------|---------------------|----------|
| 4" | Full port | 5/8" | 4-1/4" | 8 |
| 5" | Reduced port | 3/4" | 4-1/2" | 8 |

¹ Bolt lengths are calculated assuming the VKF1x valve is being mounted between two 125#/150# ANSI flanges, with two 1/16" thick gaskets, two SAE washers, and one standard hex nut

Dimensions (continued)

Dimensions in inches [mm]

VKF1x.125 – 5" valve

Weight: 16.7 lb [7.6 kg]

Table 14: Recommended Bolts for Mounting VKF1x.125 Valves between Flanges

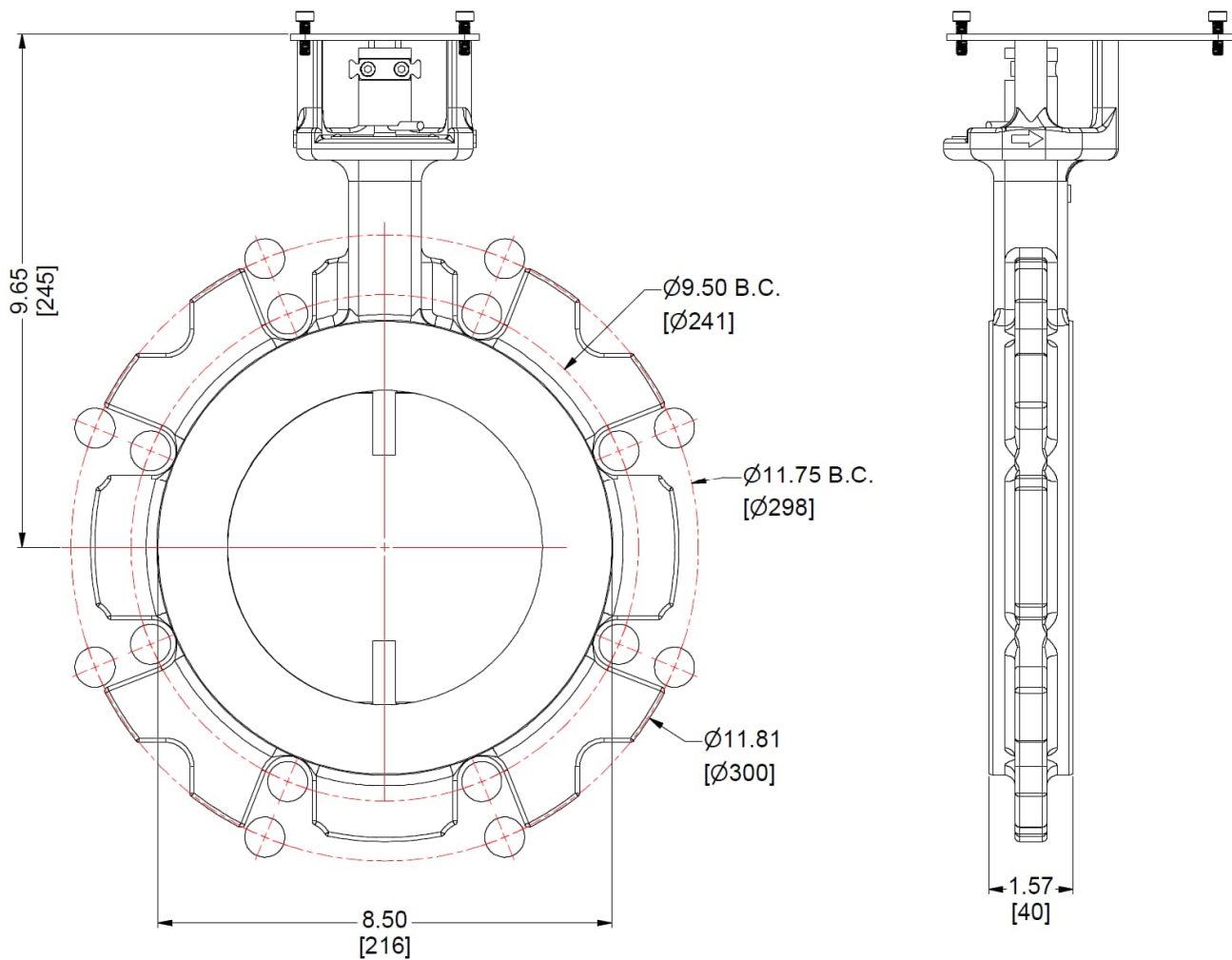
| Flange Size | Application | Nominal Diameter | Length ¹ | Quantity |
|-------------|--------------|------------------|---------------------|----------|
| 5" | Full port | 3/4" | 5" | 8 |
| 6" | Reduced port | 3/4" | 5" | 8 |

¹ Bolt lengths are calculated assuming the VKF1x valve is being mounted between two 125#/150# ANSI flanges, with two 1/16" thick gaskets, two SAE washers, and one standard hex nut

Dimensions (continued)

Dimensions in inches [mm]

VKF1x.150 – 6" valve



Weight: 21.1 lb [9.6 kg]

Table 15: Recommended Bolts for Mounting VKF1x.150 Valves between Flanges

| Flange Size | Application | Nominal Diameter | Length ¹ | Quantity |
|-------------|---------------------------|------------------|---------------------|----------|
| 6" | Full port | 3/4" | 5" | 8 |
| 8" | Reduced port ² | 3/4" | 5-1/4" | 8 |

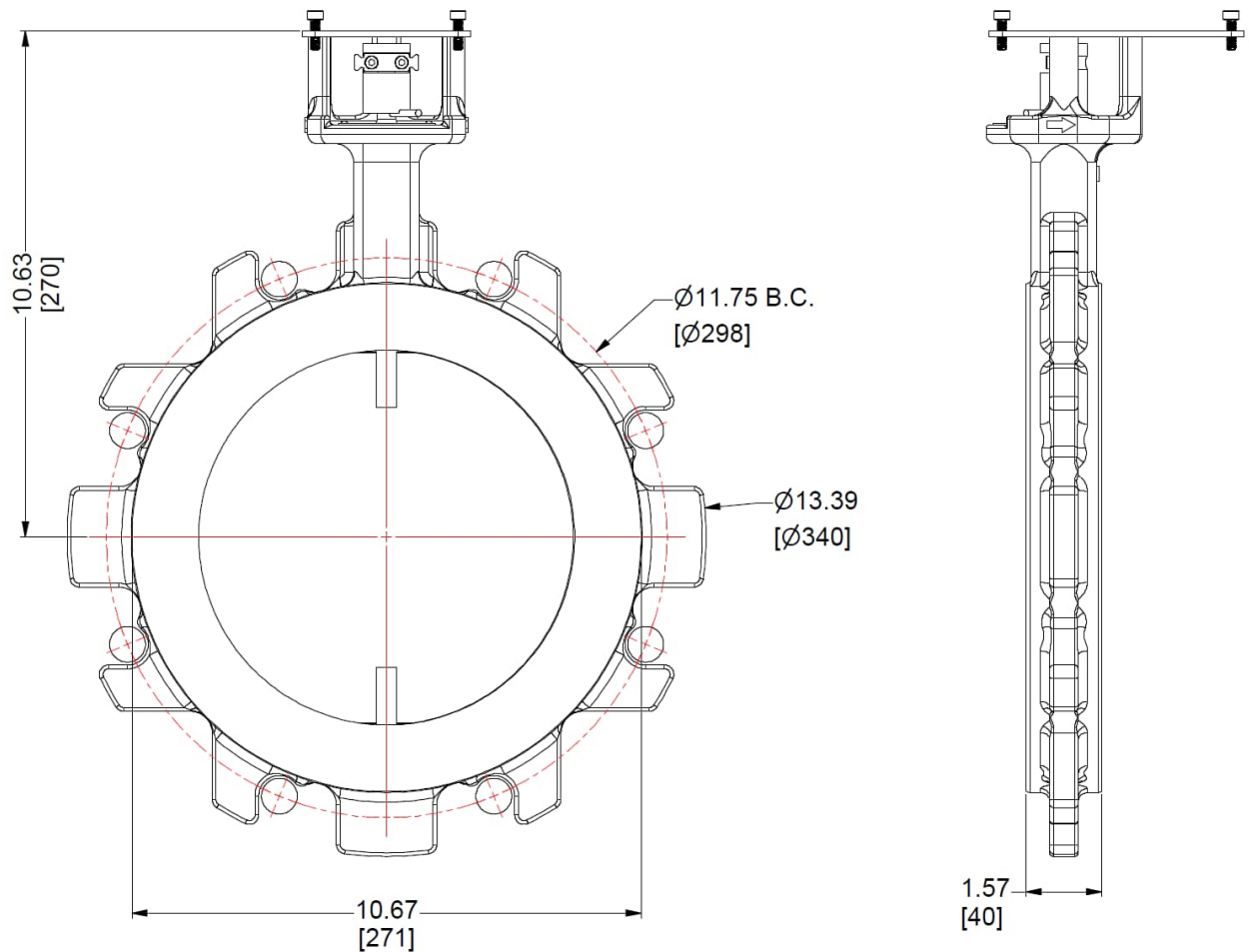
¹ Bolt lengths are calculated assuming the VKF1x valve is being mounted between two 125#/150# ANSI flanges, with two 1/16" thick gaskets, two SAE washers, and one standard hex nut

² When using a 6" VKF1x.150 valve as a reduced port valve, 8" butt-weld flanges and 6" full-face gaskets with bolt holes must be used. See "Mounting flange notes" on page 2 for a more detailed explanation.

Dimensions (continued)

Dimensions in inches [mm]

VKF1x.200 – 8” valve



Weight: 28.2 lb [12.8 kg]

Table 16: Recommended Bolts for Mounting VKF1x.200 Valves between Flanges

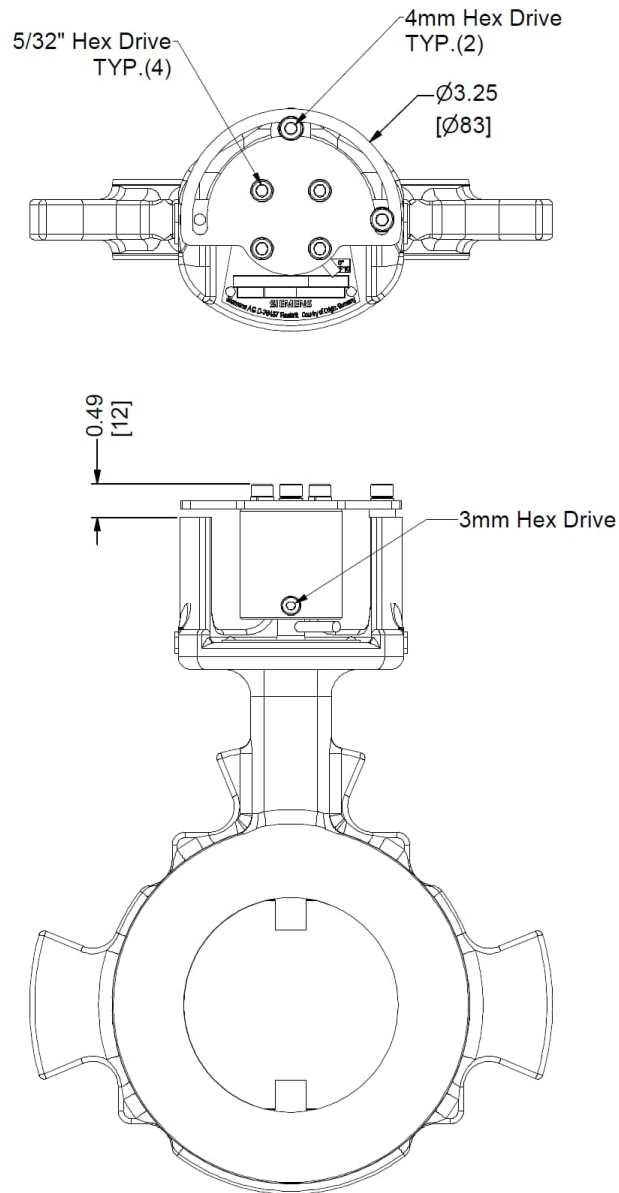
| Flange Size | Application | Nominal Diameter | Length ¹ | Quantity |
|-------------|-------------|------------------|---------------------|----------|
| 8" | Full port | 3/4" | 5-1/4" | 8 |

¹ Bolt lengths are calculated assuming the VKF1x valve is being mounted between two 125#/150# ANSI flanges, with two 1/16" thick gaskets, two SAE washers, and one standard hex nut

Dimensions (continued)

Dimensions in inches [mm]

VKF1x.xxx-MH – Manual kit



Dimensions (continued)

Dimensions in inches [mm]

CA-VKF1X-x – Crank arm kit

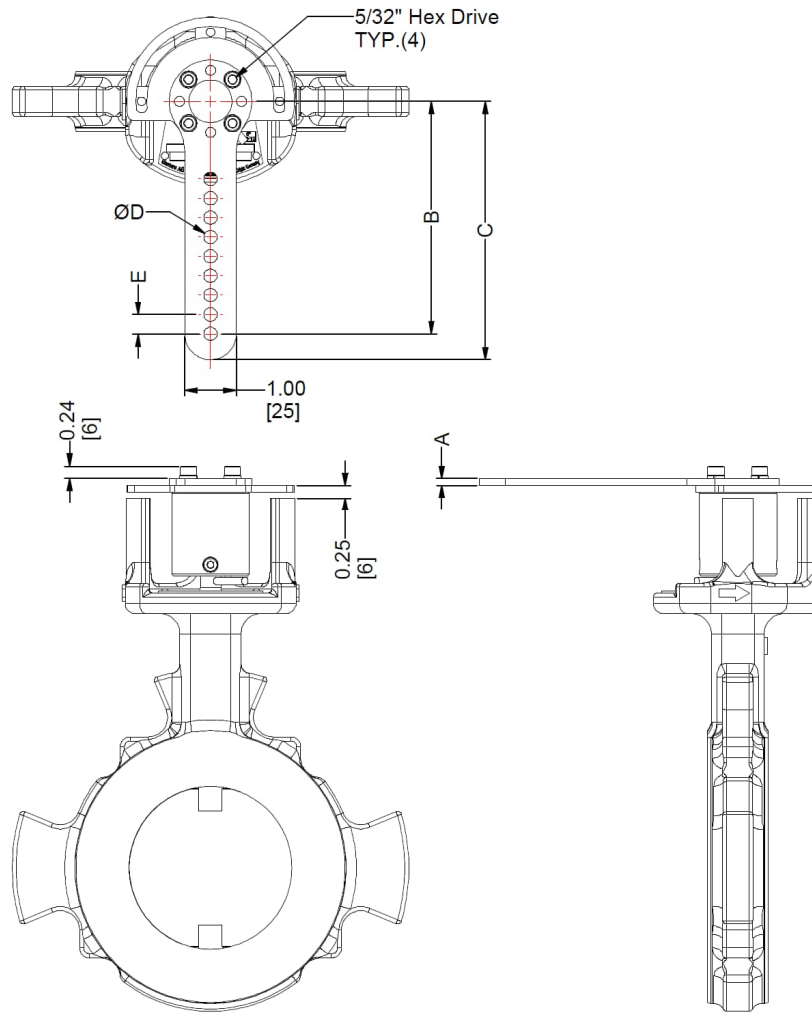
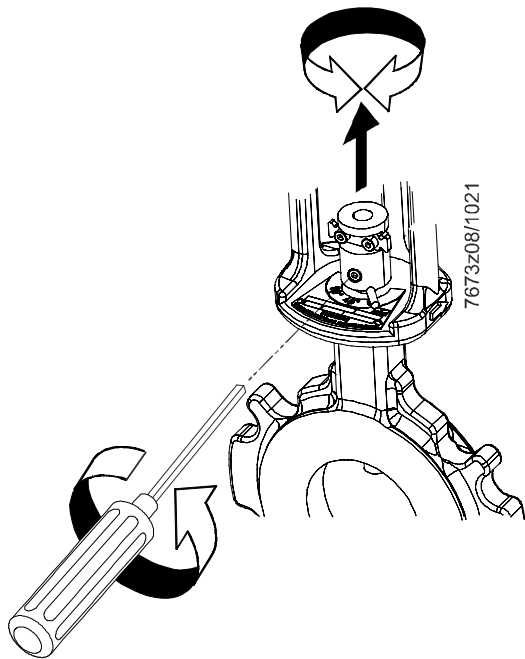
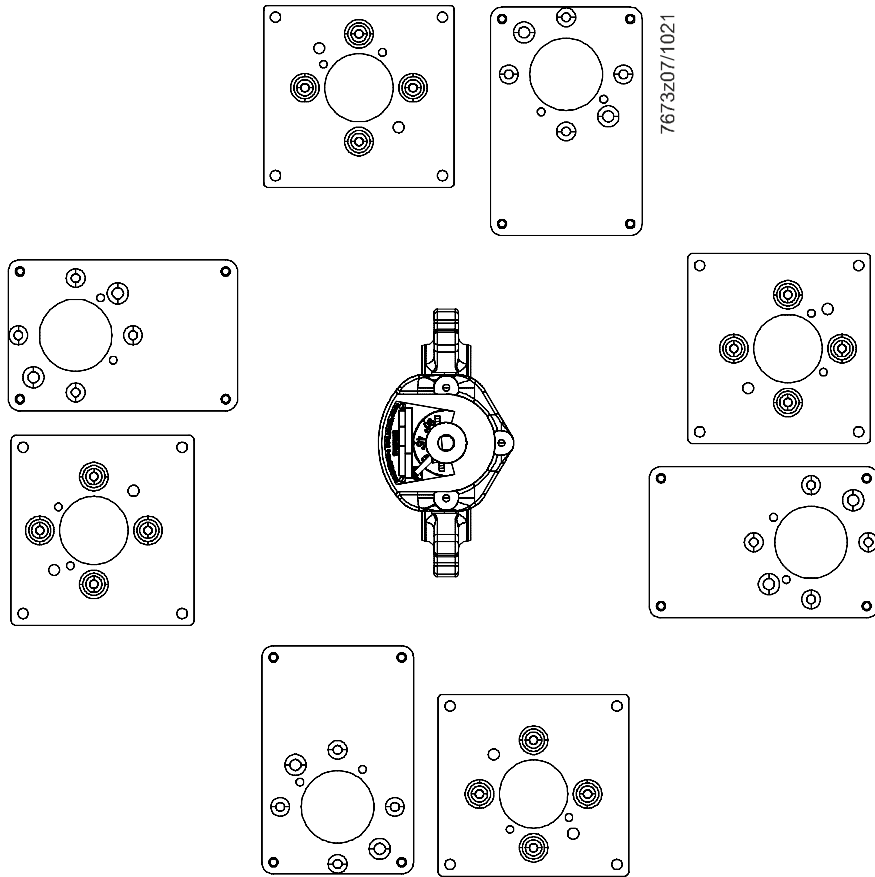


Table 17: CA-VKF1X-x – Crank Arm Kit Dimensions

| Part Number | A | B | C | D | E |
|-------------|-----------|------------|------------|---------------|----------------|
| CA-VKF1X-1 | 0.38 [10] | 4.80 [122] | 5.25 [133] | 0.39 [10] x6 | 0.58 [15] |
| CA-VKF1X-2 | 0.14 [3] | 4.50 [114] | 5.00 [127] | 0.26 [7] x9 | 0.38 [10] |
| CA-VKF1X-3 | 0.14 [3] | 4.50 [114] | 5.00 [127] | 0.26 [7] slot | 3.00 [76] slot |

Mounting instructions

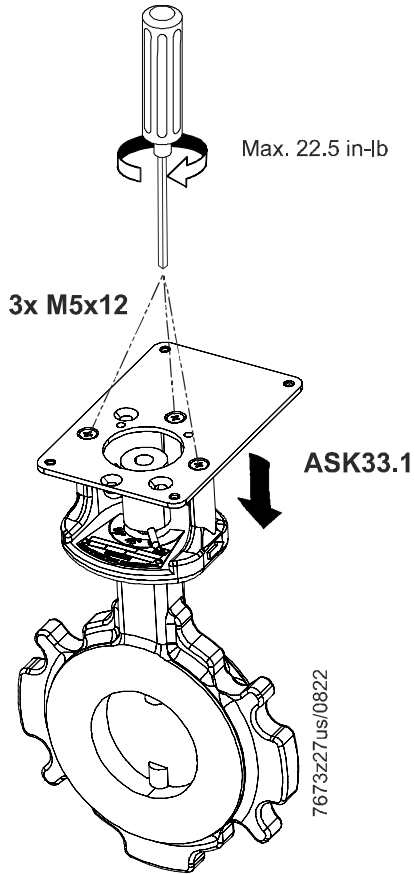
Mounting position of the mounting plate



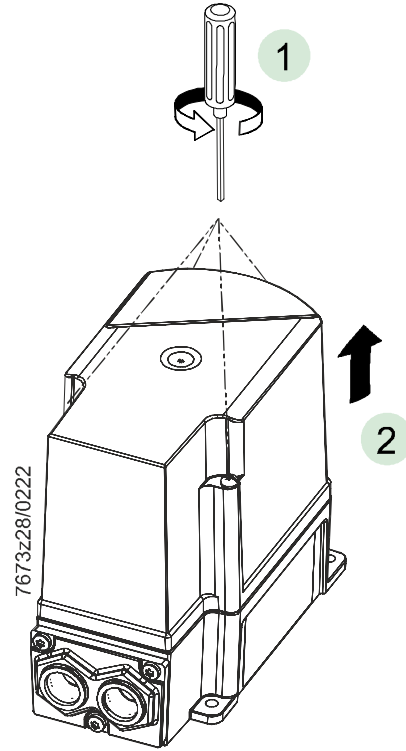
Loosen the screw. Align the coupling to suit the mounting position of the mounting plate. Tighten the screw again (max. 18 in-lb).

Mounting instructions (continued)

1.a

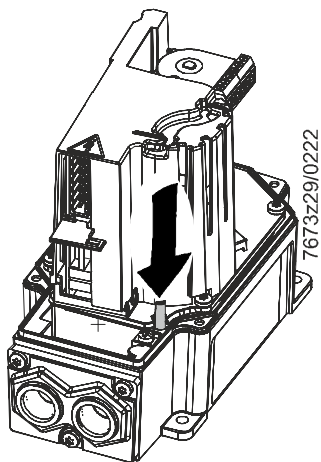


1.b

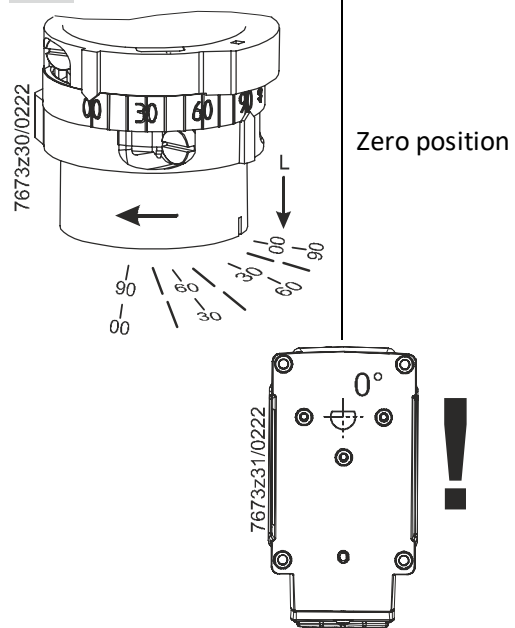


1.c

Release the coupling while pressing the pressure pin down.

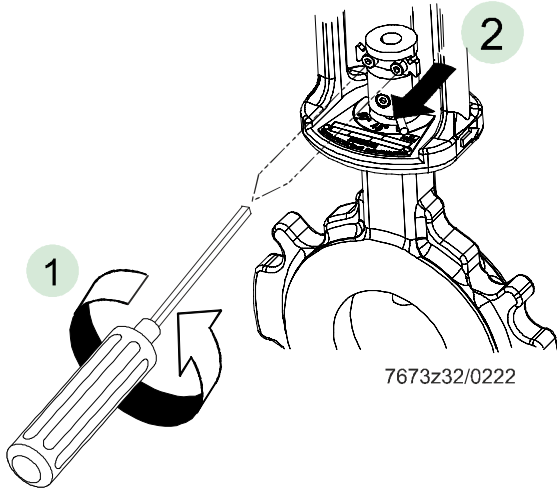


1.d



Mounting instructions (continued)

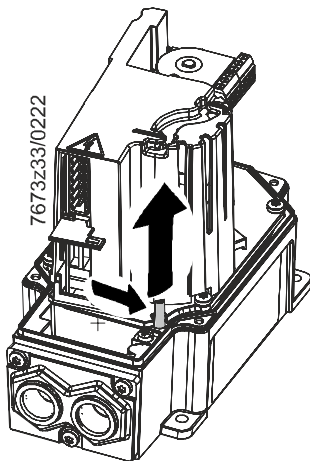
1.e



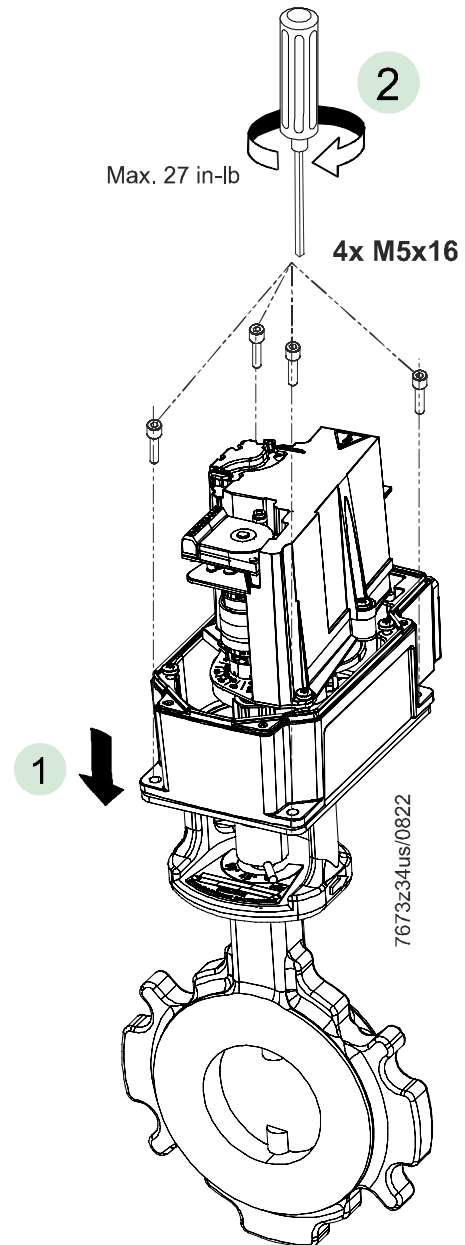
- 1 Loosen the screws.
- 2 Pull the plate in the direction of the arrow and mount the actuator.

1.g

Lock the coupling while loosening the pressure pin.

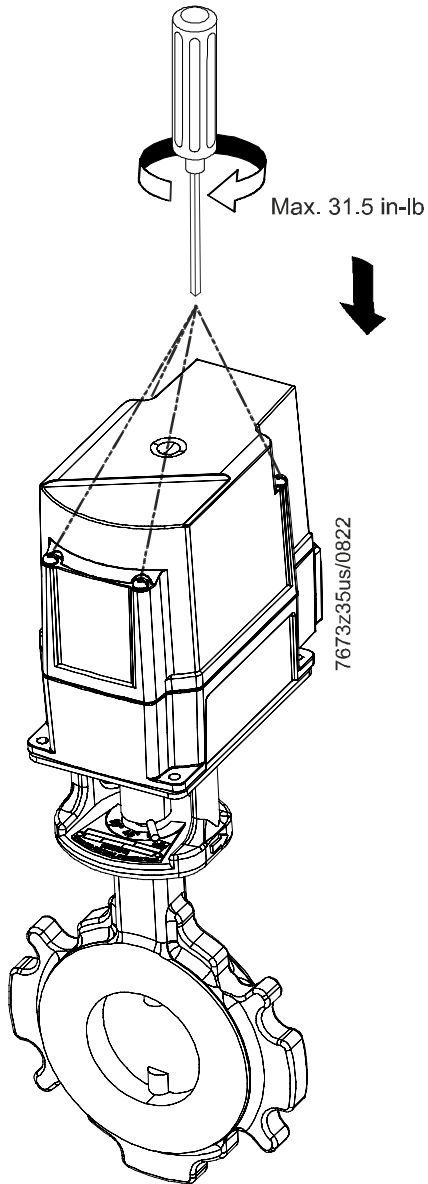


1.f



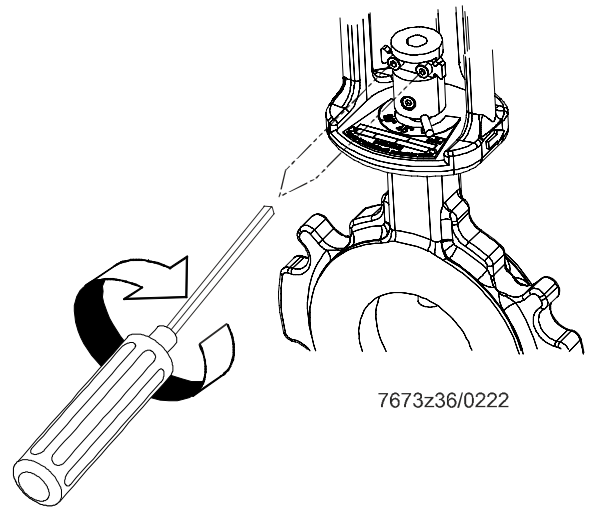
Mounting instructions (continued)

1.h



1.i

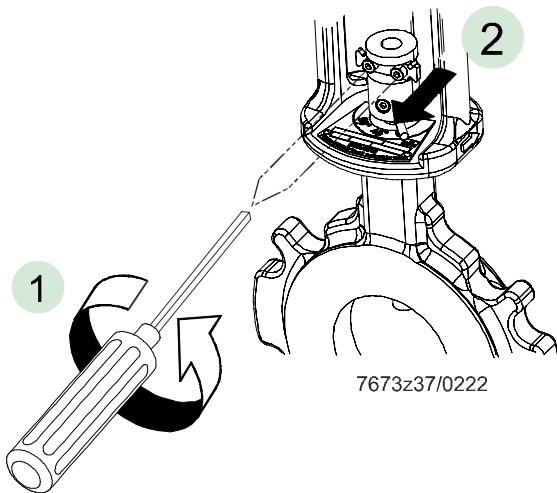
Tighten the screws (max. 18 in-lb).



Mounting instructions (continued)

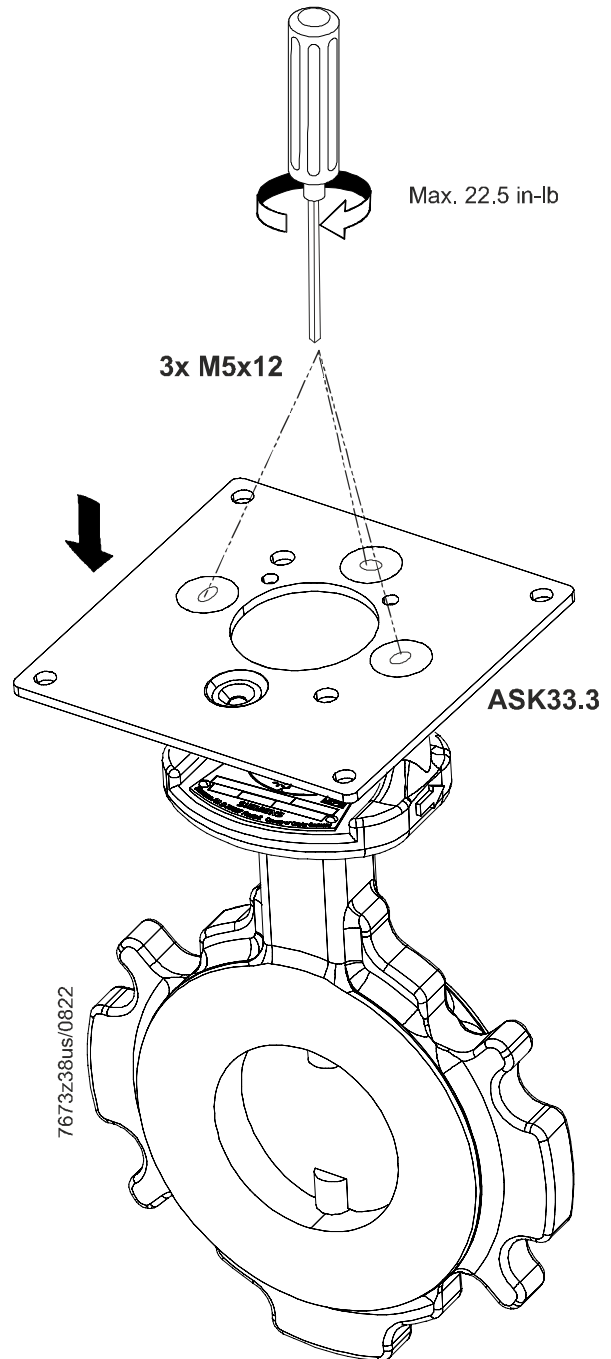
2.a

→ ASK33.3 (for SQM5)



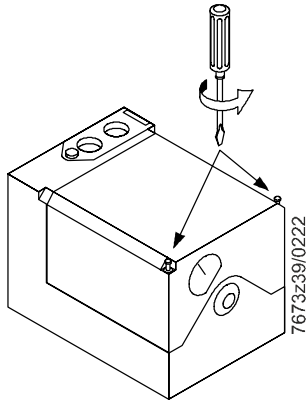
- 1 Loosen the screws.
- 2 Pull the plate in the direction of the arrow and mount the actuator.

2.b

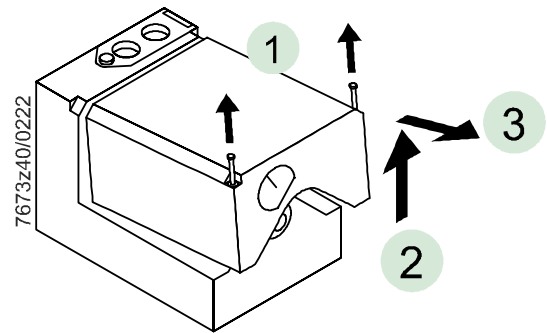


Mounting instructions (continued)

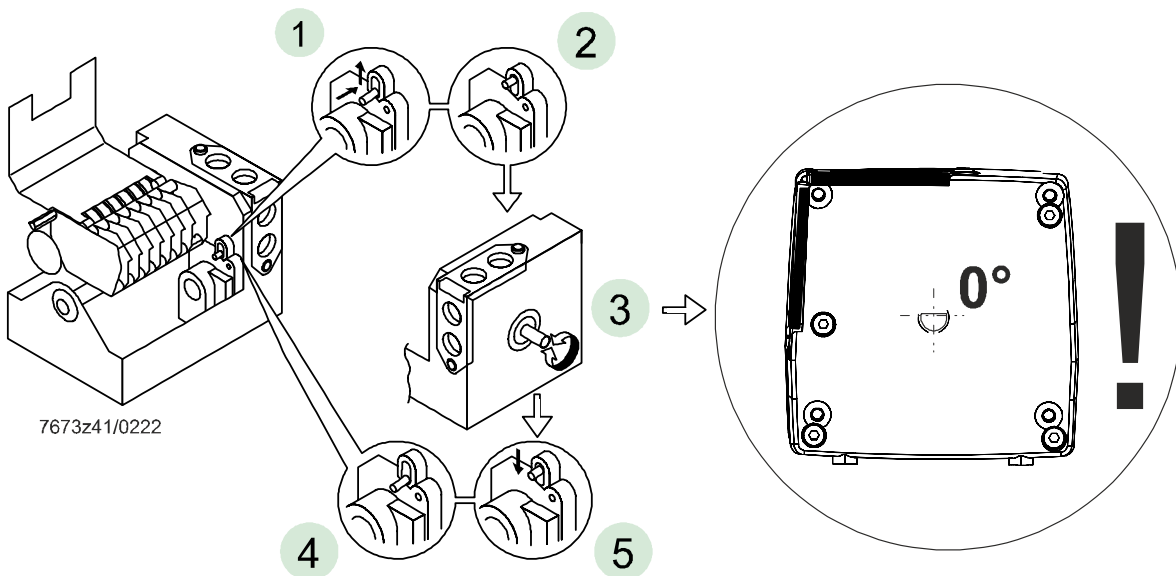
2.c



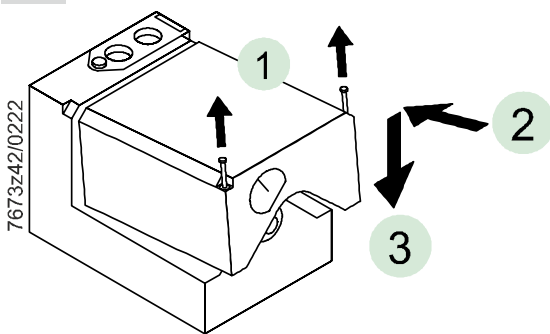
2.d



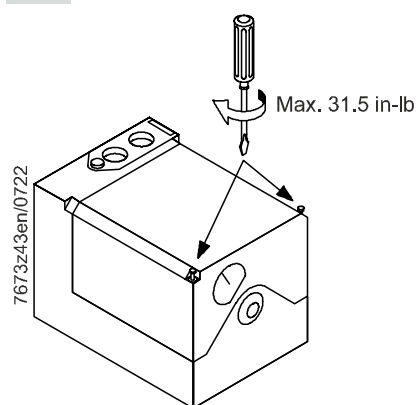
2.e



2.f

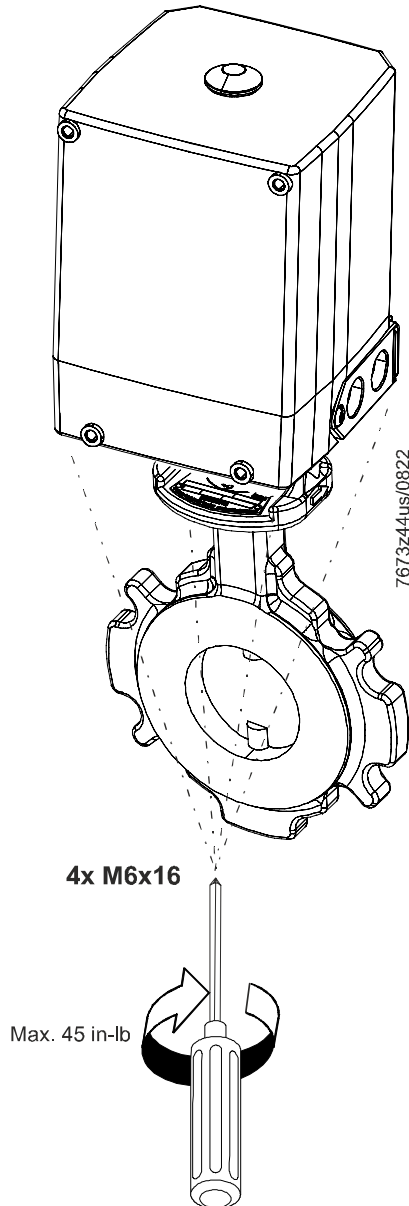


2.g



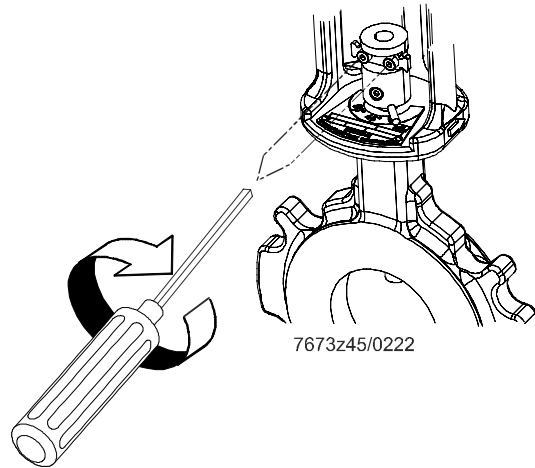
Mounting instructions (continued)

2.h



2.i

Tighten the screws (max. 18 in-lb).



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