

# Subsea Valves

API 6A Small Bore Ball and Needle Valves  
For Subsea Oil & Gas Exploration



ENGINEERING YOUR SUCCESS.



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 **WARNING**

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# Subsea Ball Valve 2-Way Soft Seat

## Overview

Parker's soft seated quarter turn ball valve for flow isolation, designed specifically to deliver smooth, low-torque performance in subsea applications. Utilising the same design technology as the standard Parker's Hi-Pro series ball valve, the subsea design incorporates the necessary design alterations to provide a reliable externally pressurised valve for the subsea industry.

Featuring PEEK self-relieving seat and PTFE packing, this subsea ball valve design incorporates additional o-ring seals, which prevent the ingress of sea water into the valve which would adversely affect the operation of the valve as well as contaminate the process liquid.

The bi-directional valves are available in a range of corrosion-resistant alloys and are suitable for equipment located at depths down to 3,050m. The valves are designed to facilitate operation either manually or by a Remotely Operated Vehicle (ROV).

Parker's subsea ball valves have been designed to meet or exceed the rigorous qualification test requirements of API 6A/17D PSL 3. The structural integrity and performance have been confirmed by independent third party inspectors.



Subsea 2-way ball valve, soft seated

## Applications (Liquid media):

- Subsea Hydraulic Manifolds
- Subsea Control Umbilicals
- Subsea Wellheads and Control Packages
- Chemical injection
- DBB, bleed, vents, test lines

## Markets:

- Upstream Oil & Gas (liquid media)

## Features, Benefits and Values

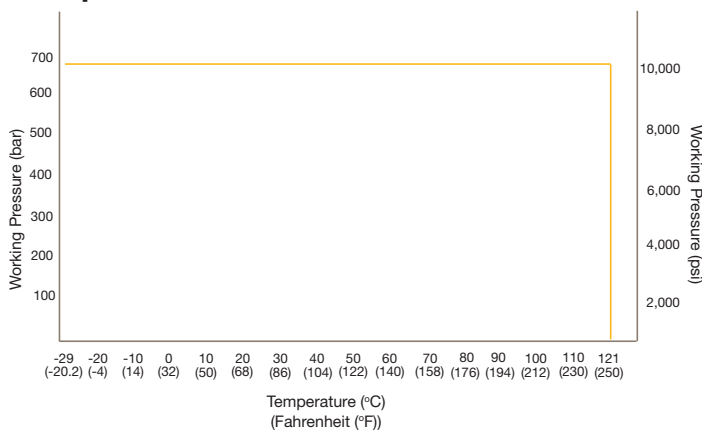
Feature	Benefit	Value
PEEK seats	Provide resistance to chemicals, heat, and wear/abrasion	Performance and reliability
Self-relieving seats	Cavity pressure relief	Safety
Low friction, pressure assisted PTFE shaft seal	Increases cycle life and reduces operating torque	Performance and reliability
Shaft and end adaptor o-ring ingress seals	Prevent water and silt ingress to any threaded or rotating parts	Performance and reliability
Adaptor metallic egress seal	No elastomers in contact with process fluid, therefore no seal deterioration	Performance and reliability
Anti-blow-out stem	Prevents stem blow-out	Safety
Unobstructed 10 mm flow path	Minimizes pressure drop	Performance and safety
API 6A compliant materials	Compliance with industry standards	Safety, performance and reliability
API 17D design validation test including API 6A PR2F protocol	Confirmation of a robust design	Reliability

# Technical Information

## Specification

Configuration	2-Way, 1/4 turn
Construction	2-Piece, side entry threaded end connector
Ball Design	Floating ball
Flow Pattern	Bi-directional (liquid)
Minimum Ball Bore Size	10 mm
Maximum Allowable Working Pressure (MAWP)	10,000 psi (689 bar)
Media Temperature Range	Class: P/V -29°C to 121°C (-20F to 250F)
Maximum Sea Depth	3050 m (10,000 ft)
Maximum External Pressure	4,500 psi (310 bar)
End Connections	AE Cone-and-Thread Butt Weld NPT
Body Materials	316 Stainless Steel Duplex Stainless Steel Super Duplex Inconel 625
Seat Material	PEEK
Principle Standards	API 6A/API 17D
Valve Design Code	API 6A/API 6X
Valve Test Pressure	API 6A PSL3
Safety Factor and Allowable Stress	API 6A/API 17D
Maximum Field Shell Hydrotest Pressure	1.5xMAWP

## Temperature/Pressure chart



Temp Class: P/V (-29°C to 121°C)

## Applicable codes and standards

API 17D	Design and Operation of Subsea Production Systems - Subsea Wellhead and Tree Equipment
API 17H / ISO 13628-8	Design and Operation of Subsea Production Systems: Remotely Operated Vehicle (ROV) interfaces on subsea production systems
API 20F	Corrosion Resistant Bolting for use in petroleum and natural gas industries
NACE MR-0175 / ISO15156	Petroleum and natural gas industries - Materials for use in H <sub>2</sub> S containing environments in oil and gas production
API 6A / ISO 10423	Specification for Wellhead and Christmas Tree Equipment
API 6X	Design calculations for pressure containing equipment
BS EN 10204	Metallic Products - Types of Inspection Document
BS EN ISO 9001	Quality Management Systems

## Valve validation testing

- Lloyds Witnessed API 17 (Section 5.1.7: Table 3) including the API 6A PR2F Bi-directional Protocol (PSL3) and the Annex L hyperbaric test
- Test undertaken on Stainless Steel UNS S31600/31603 valves
- Protocol carried out hydrostatically for all ambient temperature parts of test (except for where high pressure gas testing was required by API 6A PR2F)

## Design Life

- API 17D Endurance test qualified
- Cathodic protection down to end user

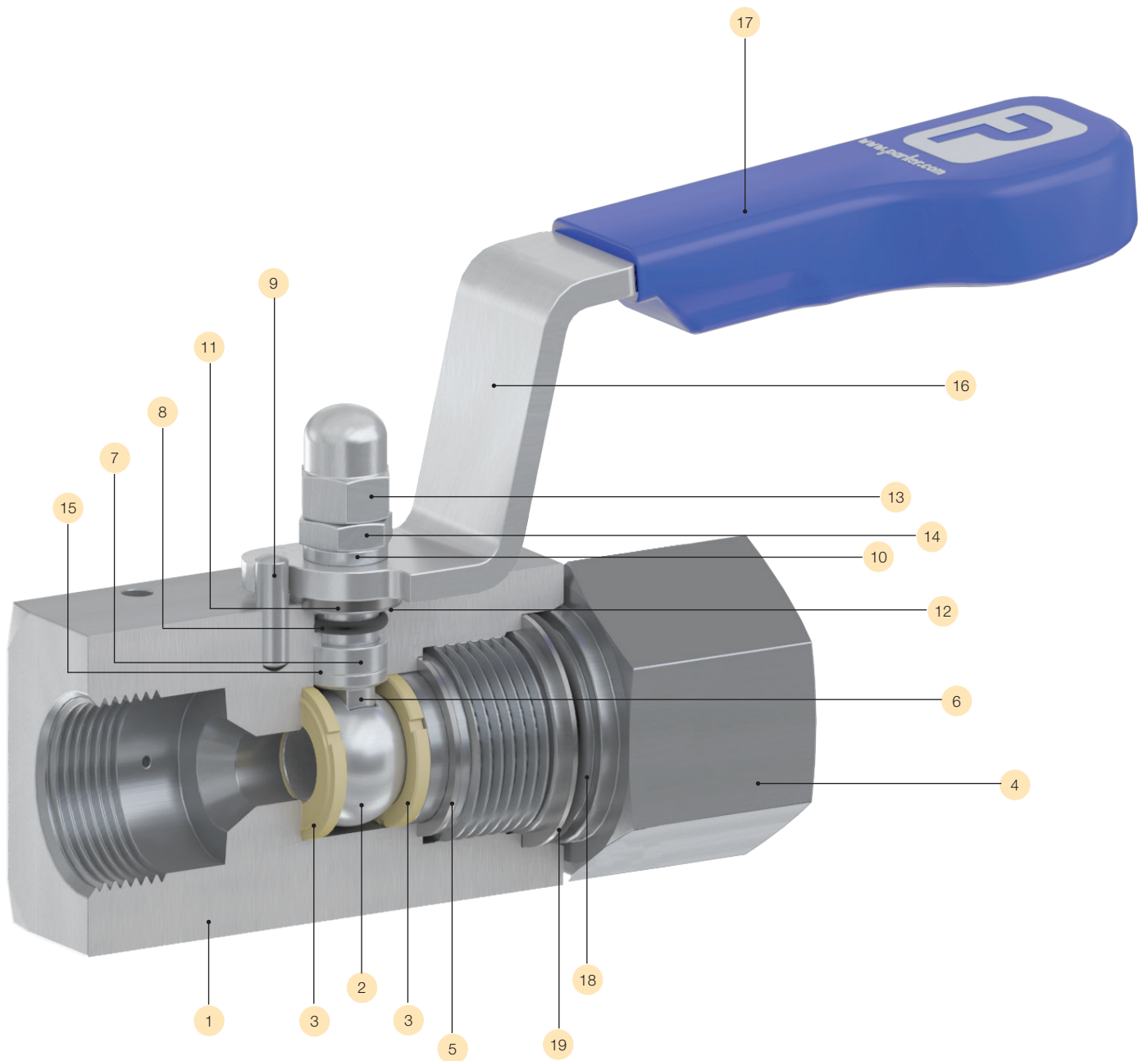
## Breakout Torque (gas at 10,000 psi)

Normal	11Nm (8ft-lbf)
Maximum*	26Nm (19ft-lbf)

Breakout Torque is the torque needed to initially rotate valve when in closed position with full MAWP on one side and 0 psi on the other.  
\* Maximum torque recorded under extreme test conditions.

# Subsea Ball Valve 2-Way Soft Seat

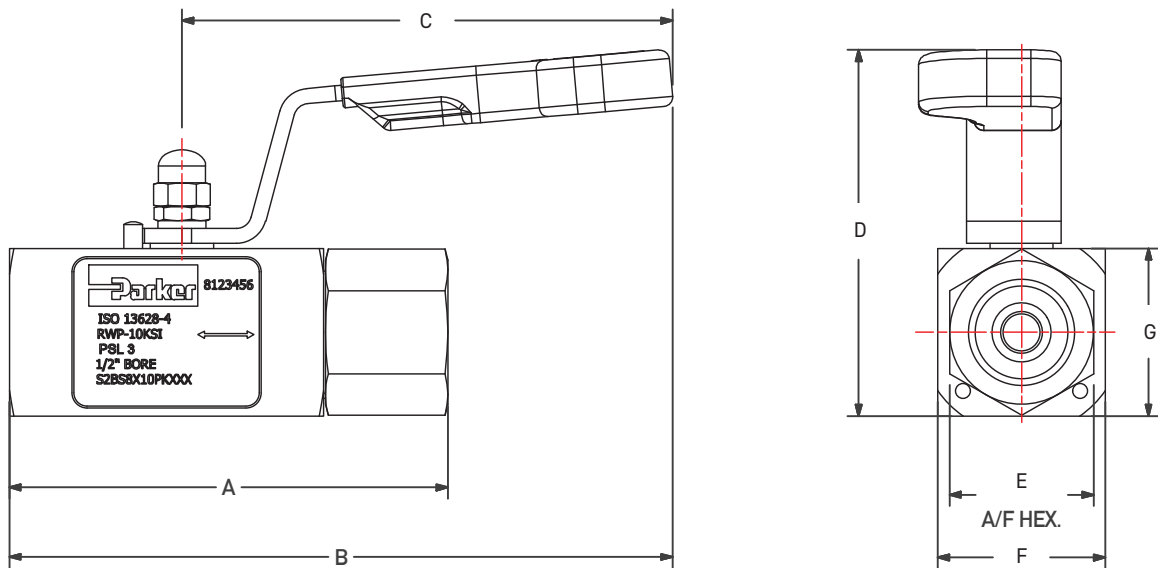
Technical Information



## Bill of Materials

Reference	Description	316 Stainless Steel	Duplex Stainless Steel	Super Duplex	Inconel 625	PSL	NACE MR-0175
1	Body	ASTM A479 UNS S31600/S31603	ASTM A479 UNS S31803	ASTM A479 UNS S32750 or UNS32760	ASTM B446 UNS N06625	Yes	Yes
2	Ball	ASTM A479 UNS S31600/S31603	ASTM B446 UNS N06625	ASTM B446 UNS N06625	ASTM B446 UNS N06625	Yes	Yes
3	Seats	PEEK	PEEK	PEEK	PEEK		
4	End Adaptor	ASTM A479 UNS S31600/S31603	ASTM A479 UNS S31803	ASTM A479 UNS S32750 or UNS32760	ASTM B446 UNS N06625	Yes	Yes
5	Joint Seal	ASTM A479 UNS S31600/S31603	ASTM A479 UNS S31245	ASTM B446 UNS N06625	ASTM B446 UNS N06625		
6	Shaft (Stem)	ASTM A564 UNS S17400	ASTM B446 UNS N06625	ASTM B446 UNS N06625	ASTM B446 UNS N06625	Yes	Yes
7	Packing	PTFE	PTFE	PTFE	PTFE		
8	Shaft O-Ring	NBR-90	NBR-90	NBR-90	NBR-90		
9	Stop Pin	316Ti Stainless Steel	316Ti Stainless Steel	316Ti Stainless Steel	316Ti Stainless Steel		
10	Thrust Bush (Top)	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel		
11	Thrust Bush (Bottom)	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel		
12	Thrust Bush (Bottom) Disc	Reinforced PTFE	Reinforced PTFE	Reinforced PTFE	Reinforced PTFE		
13	Lock Nut	A4. Stainless Steel	A4. Stainless Steel	A4. Stainless Steel	A4. Stainless Steel		
14	Nut	A4. Stainless Steel	A4. Stainless Steel	A4. Stainless Steel	A4. Stainless Steel		
15	Internal Gland Thrust Disc	Reinforced PTFE	Reinforced PTFE	Reinforced PTFE	Reinforced PTFE		
16	Handle	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel		
17	Handle Grip	Plastic	Plastic	Plastic	Plastic		
18	Adaptor Ingress O-Ring	NBR-90	NBR-90	NBR-90	NBR-90		
19	Adaptor Backup Ring	PTFE	PTFE	PTFE	PTFE		
20	Adaptor Stop Pin	316Ti Stainless Steel	316Ti Stainless Steel	316Ti Stainless Steel	316Ti Stainless Steel		

## Dimensions and Weight

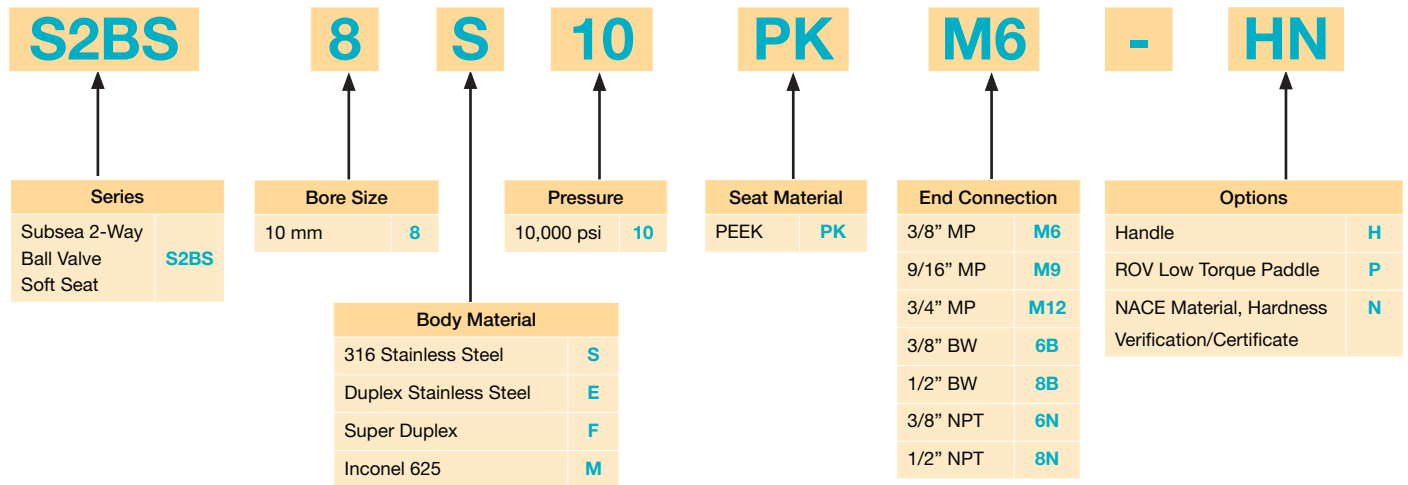


Inlet/Outlet	Dimension														Weight (Valve with handle) kg
	A		B		C		D		E		F		G		
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	
9/16" MP	104.7	4.12	170.6	6.72	129.7	5.11	96.8	3.81	38.1	1.50	44.3	1.75	44.3	1.75	1.50
3/4" MP	115.9	4.56	175.4	6.9	129.7	5.11	96.8	3.81	38.1	1.50	44.3	1.75	44.3	1.75	1.54

Dimensions for reference only and subject to change. Contact Parker for other dimensions.

# Subsea Ball Valve 2-Way Soft Seat

## Ordering Information



Example part number: **S2BS8S10PKM6-HN**

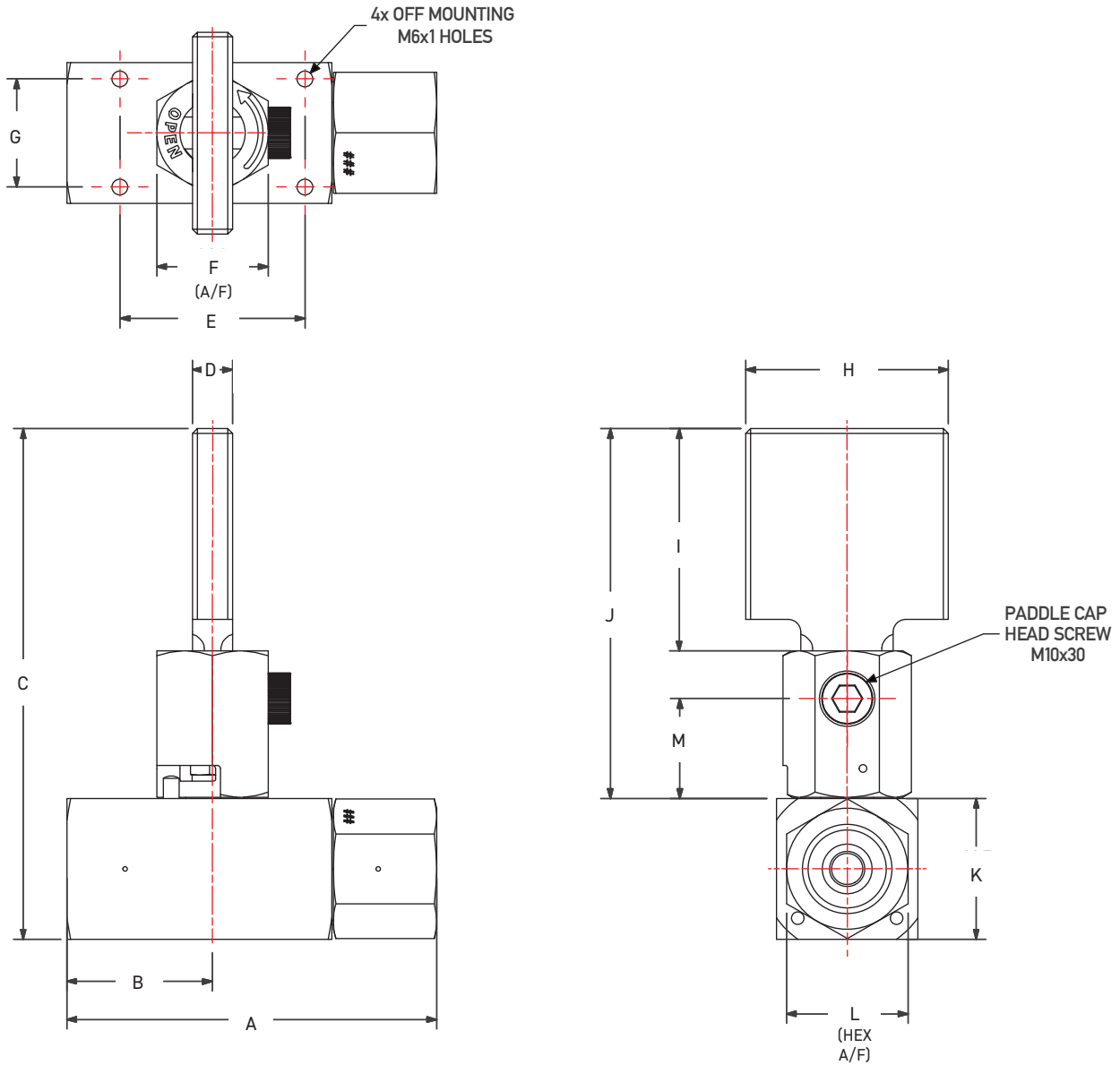
### Notes:

1. All valves with cone and thread connection include collars and gland nuts.
2. Buttweld adaptor options are available (pressure rating dependent on configuration) - contact Parker Instrumentation Products Division Europe.
3. These valves are adaptable for Remotely Operated Vehicle (ROV) operation. See paddle design on the next page.
4. ROV bucket designs can be provided on request.
5. Certification requirements and customer specifications **MUST** be provided at enquiry and order stage.
6. Contact Parker Instrumentation Products Division Europe technical support on +44 (0)1271 3131 or your local distributor for information on other options.



## ROV Low Torque Paddle

Parker's subsea ball valves can be ordered with a paddle for ROV operation.



### Dimensions and Weights

Inlet /Outlet	Dimension																Weight (Valve with paddle) kg										
	A		B		C		D		E		F		G		H			I		J		K		L		M	
	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch	mm	inch		mm	inch	mm	inch	mm	inch	mm	inch	mm	inch
9/16" MP	104.7	4.12	40.9	1.61	160.7	6.33	12.5	0.49	57.0	2.24	34.9	1.38	34.0	1.34	63.5	2.50	70.0	2.76	116.4	4.58	44.5	1.75	38.1	1.50	31.4	1.24	2.08
3/4" MP	115.9	4.56	45.7	1.80	160.7	6.33	12.5	0.49	57.0	2.24	34.9	1.38	34.0	1.34	63.5	2.50	70.0	2.76	116.4	4.58	44.5	1.75	38.1	1.50	31.4	1.24	2.11

### Paddle Bill of Materials

Description	Material
Paddle	ASTM A240 UNS S31600
Paddle hub	ASTM A479 UNS S31600/S31603
Paddle cap head screw	316 Stainless Steel

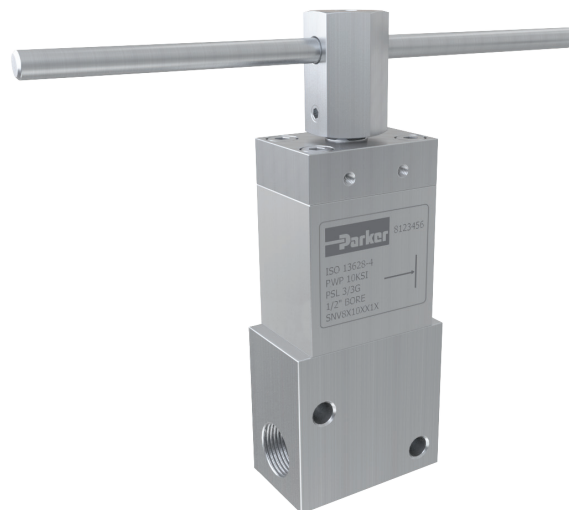
# Subsea Needle Valve Non-Rising, Non-Rotating Stem

## Overview

Parker's non-rising, non-rotating stem needle valve designed specifically to deliver smooth, low-torque performance in subsea applications. Featuring metal-to-metal seat for bubble-tight shut-off, longer stem/seat life, greater durability for repeated on/off cycles and reinforced PTFE/PEEK chevron packing below stem threads for dependable stem and body sealing. This subsea needle valve incorporates additional o-ring seals, which prevent the ingress of sea water into the valve which could adversely affect the operation of the valve as well as contaminate the process fluid.

The uni-directional valves are available in a range of corrosion-resistant alloys and are suitable for equipment located at depths down to 3,050m. The valves are designed to facilitate operation either manually or by a Remotely Operated Vehicle (ROV).

Parker's subsea needle valves have been designed to meet or exceed the rigorous qualification test requirements of API 6A/17D PSL 3/3G. The structural integrity and performance have been confirmed by independent third party tests.



Subsea needle valve, non-rising, non-rotating stem

### Applications:

- Subsea Hydraulic Manifolds
- Subsea Control Umbilicals
- Subsea Wellheads and Control Packages
- Chemical injection
- DBB, bleed, vents, test lines

### Markets:

- Upstream Oil & Gas

## Features, Benefits and Values

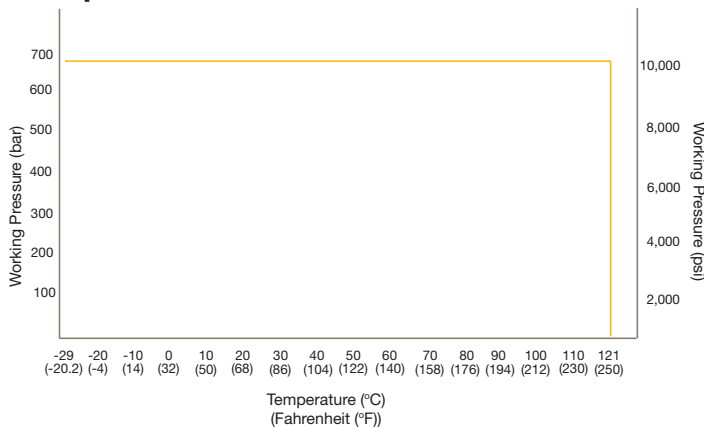
Feature	Benefit	Value
Non-rising, non-rotating stem	Protects against stem galling and seat damage	Performance and reliability
Bolted bonnet construction	Protection of threads from process fluid, ease of disassembly and maintenance	Safety and reliability
Metal-to-Metal seats	Bubble-tight shut-off, longer stem/seat life, greater durability for repeated on/off cycles and excellent corrosion resistance	Performance and reliability
Low friction, pressure assisted PEEK and PTFE chevron packing	Increases cycle life and reduces operating torque	Performance and reliability
Double o-ring stem ingress seals on bonnet housing	Prevent water and silt ingress to any threaded or rotating parts	Safety
API 6A compliant materials	Compliance with industry standards	Safety, performance and reliability
API 17D design validation test including API 6A PR2F protocol carried out pneumatically	Confirmation of a robust design	Reliability

# Technical Information

## Specification

Valve Design	Non-Rotating Stem
Configuration	2-Way Straight
Construction	3-Piece, bolted bonnet
Flow Pattern	Uni-directional
Minimum Seat Bore Size	12 mm
Maximum Allowable Working Pressure (MAWP)	10,000 psi (689 bar)
Media Temperature Range	Class: P/V -29°C to 121°C (-20F to 250F)
Maximum Sea Depth	3050 m (10,000 ft)
Maximum External Pressure	4,500 psi (310 bar)
End Connections	AE Cone-and-Thread Butt Weld NPT
Body Materials	316 Stainless Steel Duplex Stainless Steel Super Duplex Inconel 625
Seat	Metal-to-Metal
Principle Standards	API 6A/API 17D
Valve Design Code	API 6A/API 6X
Valve Test Pressure	API 6A PSL3/3G
Safety Factor and Allowable Stress	API 6A/API 17D
Maximum Field Shell Hydrotest Pressure	1.5xMAWP

## Temperature/Pressure chart



Temp Class: P/V (-29°C to 121°C)

## Applicable codes and standards

API 17D / ISO 13628-4	Design and Operation of Subsea Production Systems - Subsea Wellhead and Tree Equipment
API 17H / ISO 13628-8	Design and Operation of Subsea Production Systems: Remotely Operated Vehicle (ROV) interfaces on subsea production systems
API 20F	Corrosion Resistant Bolting for use in petroleum and natural gas industries
NACE MR-0175 / ISO15156	Petroleum and natural gas industries - Materials for use in H <sub>2</sub> S containing environments in oil and gas production
API 6A / ISO 10423	Specification for Wellhead and Christmas Tree Equipment
API 6X	Design calculations for pressure containing equipment
BS EN 10204	Metallic Products - Types of Inspection Document
BS EN ISO 9001	Quality Management Systems

## Valve validation testing

- Lloyds Witnessed API 17D (Section 5.1.7: Table 3) including the API 6A PR2F Bi-directional Protocol (PSL3/3G) and the Annex L hyperbaric test
- Test undertaken on Stainless Steel UNS S31600/31603 valves
- Other than hydrostatic elements of the FAT and hyperbaric testing the Protocol was carried out pneumatically for all internal pressure testing

## Design Life

- API 17D Endurance test qualified
- Cathodic protection down to end user

## Closing Torque (gas at 10,000 psi)

Normal	42.5Nm (31.3ft-lbf)
Maximum*	65Nm (48ft-lbf)

Closing Torque is the torque required to re-seat the valve.  
\* Maximum torque recorded under extreme test conditions.

**Number of rotations to fully open and close: Max. 5**

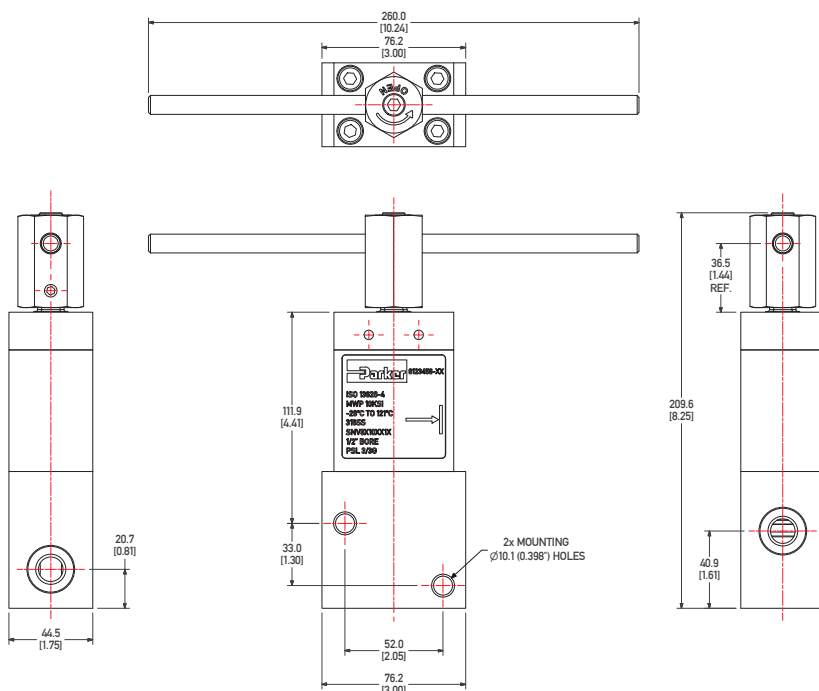


## Bill of Materials

Reference	Description	316 Stainless Steel	Duplex Stainless Steel	Super Duplex	Inconel 625	PSL	NACE MR-0175
1	Body	ASTM A479 UNS S31600/S31603	ASTM A479 UNS S31803	ASTM A479 UNS S32750 or UNS32760	ASTM B446 UNS N06625	Yes	Yes
2	Bonnet	ASTM A479 UNS S31600/S31603	ASTM A479 UNS S31803	ASTM A479 UNS S32750 or UNS32760	ASTM B446 UNS N06625	Yes	Yes
3	Bonnet Top	ASTM A479 UNS S31600/S31603	ASTM A479 UNS S31803	ASTM A479 UNS S32750 or UNS32760	ASTM B446 UNS N06625	Yes	Yes
4	Lower Stem	ASTM A564 UNS S17400	API 6A UNS N07718	API 6A UNS N07718	API 6A UNS N07718	Yes	Yes
5	Upper Stem	ASTM A479 UNS S20910	ASTM UNS S20910	ASTM A479 UNS S20910	ASTM B446 UNS N06625	Yes	Yes
6	Thrust Bush	ASTM B150 UNS C63000	ASTM B150 UNS C63000	ASTM B150 UNS C63000	ASTM B150 UNS C63000		
7	Bonnet lower O-ring	NBR-90	NBR-90	NBR-90	NBR-90		
8	Bonnet top O-ring	NBR-90	NBR-90	NBR-90	NBR-90		
9	Upper Stem O-ring	NBR-90	NBR-90	NBR-90	NBR-90		
10 (11-14)	Chevron Packing	N/A	N/A	N/A	N/A		
11	Bottom Adaptor	PEEK	PEEK	PEEK	PEEK		
12	V-Ring (PEEK)	PEEK	PEEK	PEEK	PEEK		
13	V-Ring (PTFE)	Reinforced PTFE	Reinforced PTFE	Reinforced PTFE	Reinforced PTFE		
14	Top Adaptor	PEEK	PEEK	PEEK	PEEK		
15	Bolts	A453 Gr 660 D	A453 Gr 660 D	A453 Gr 660 D	A453 Gr 660 D	Yes	Yes
16	Handle bar	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel		
17	Handle hub	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel		
18	Handle cap head screw	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel		
19	Handle locking grub screw	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel		
20	Hub locking grub screw	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel	316 Stainless Steel		

## Dimensions and Weight

### 3/4" MP Cone-and-Thread Inlet/Outlet



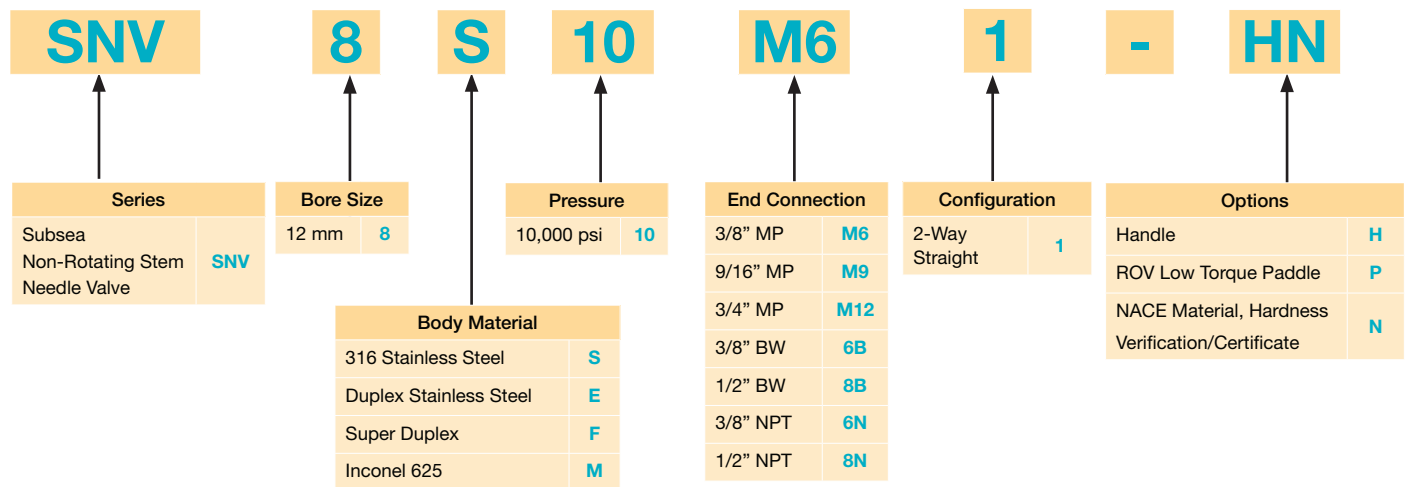
### Weight

Inlet/Outlet	Weight (Valve with handle)
3/4" MP	3.8 kg

Dimensions for reference only and subject to change. Contact Parker for other dimensions.

# Subsea Needle Valve Non-Rising, Non-Rotating Stem

## Ordering Information



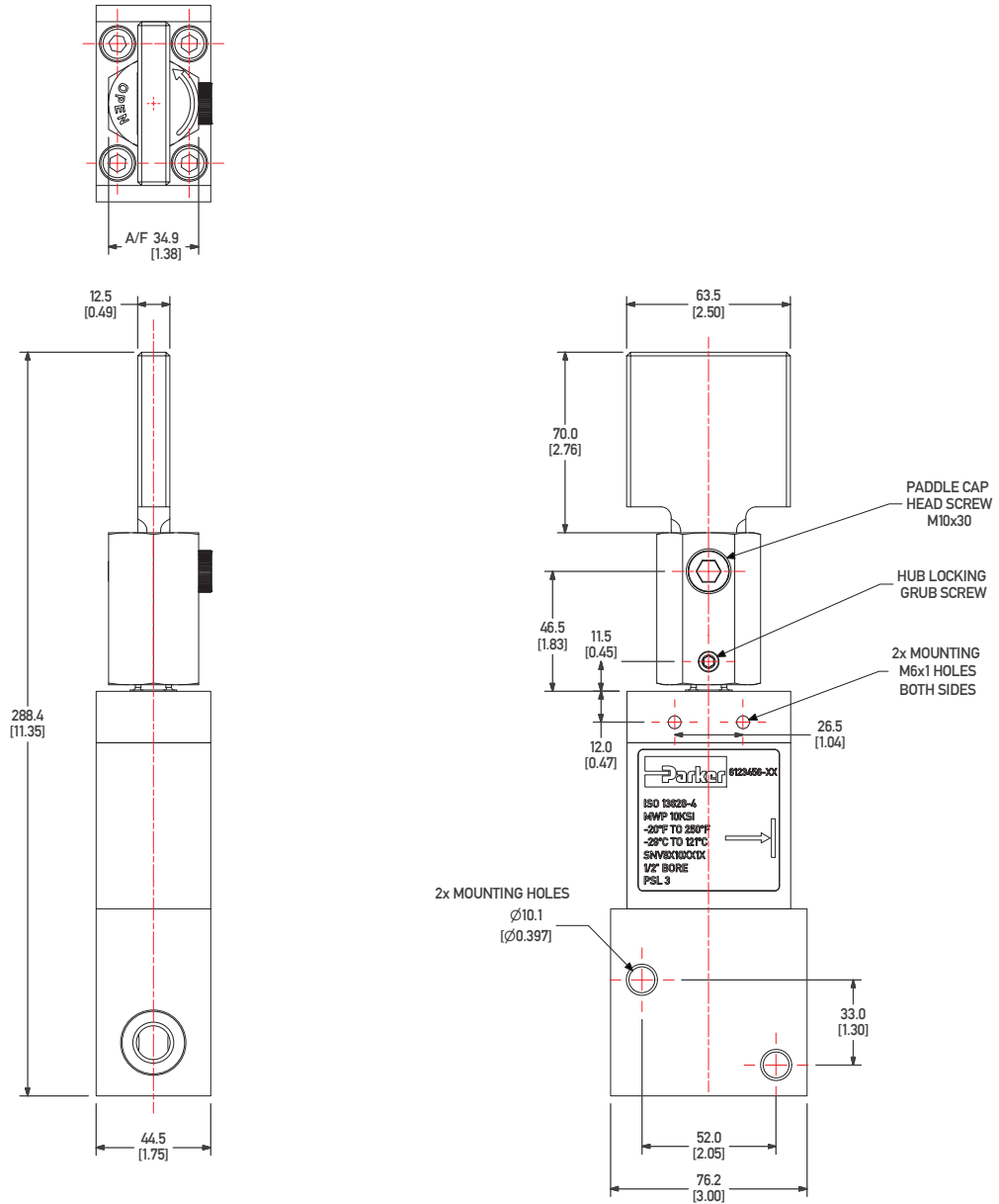
Example part number: **SNV8S10M61-HN**

### Notes:

1. All valves with cone and thread connection include collars and gland nuts.
2. The standard offering of buttweld connections is achieved by using male to male adaptors - cone and thread to buttweld connection (pressure rating dependent on configuration). Contact Parker Instrumentation Products Division Europe for other options.
3. These valves are adaptable for Remotely Operated Vehicle (ROV) operation. See paddle design on the next page.
4. ROV bucket designs can be provided on request.
5. Certification requirements and customer specifications MUST be provided at enquiry and order stage.
6. Contact Parker Instrumentation Products Division Europe technical support on +44 (0)1271 3131 or your local distributor for information on other options.

## ROV Low Torque Paddle

Parker's subsea needle valves can be ordered with a paddle for ROV operation.



### Paddle Bill of Materials

Description	Material
Paddle	ASTM A240 UNS S31600
Paddle hub	ASTM A479 UNS S31600/S31603
Paddle cap head screw	316 Stainless Steel

### Weight

Inlet/Outlet	Weight (Valve with paddle)
3/4" MP	4.2 kg

## Commonly used terms when conducting business with Parker

Acronym	Title	Description
API	American Petroleum Institute	The American Petroleum Institute (API) is the largest U.S. trade association for the oil and natural gas industry.
PSL	Product Specification Level	Material compliance and factory acceptance testing
NDE	Non Destructive Examination	Volumetric and surface non destructive testing
FAT	Factory Acceptance Test	Pressure testing
	Serialization	An assignment of a unique code to individual parts and / or pieces of equipment to maintain records

API 6A - Quality control for bodies, bonnets, end and outlet connections - PSL 3/3G - Parker Compliance				
		API Product Specification Level	API Sub-Clause	Additional Industry Codes
PSL3/3G material testing includes:	Tensile testing	PSL 3/3G	6.3.2.2	ASTM A370
	Impact testing	PSL 3/3G	6.3.2.3	ASTM A370
PSL3/3G NDE includes:	Hardness testing	To Parker Standard	10.4.2.4	
	Dimensional inspection	To Parker Standard	10.4.2.5	
	Traceability	PSL 3/3G	10.4.2.8	
	Chemical analysis	PSL 3/3G	6.3.5	ASTM A388
	Volumetric NDE	PSL 3/3G	10.4.12.12	ASTM E165 / ASTM E709
	Surface NDE	PSL 3/3G-	10.4.2.10 & 10.4.2.11	
	Serialization	PSL 3/3G	10.4.2.9	
Ferroscope:	On request	to Parker standard		
NORSOK M630 Additional testing includes*:	Corrosion testing			
	Micrographic examination			ASTM G48
	Ferrite counting			ASTM A923
	*(Duplex and Super Duplex materials only)			ASTM E562

API 6A - Quality control requirements for regular and Venturi bore valves - PSL3/3G - Parker Compliance				
		Product Specification Level		Parker Comments
Factory Acceptance testing:		PSL3	PSL 3G	
Hydrostatic test (extended)	Body	11.2.3	11.2.3	
	Seat	11.2.4	11.2.4	
Gas test	Body	-	11.3.3	
	Seat	-	11.3.4	
Traceability		10.4.7.2	10.4.7.2	Providing HCT 3.1B is selected
Serialization		10.4.7.3	10.4.7.3	Each tested assembly will have serial number against works order no.