tekno valves

50 YEARS OF EXCELLENCE

Post-Type & Toggle Operated Pin Index Valves for Medical Gases

Detailed Series Catalogue

BPTN-12 & BPKN-12

Approved for MRI Environment
MR
3T

BAM
TPED Certification by BAM as notified body: ID-0589

Your safety is valued

ISO 9001 & TPED certified valve manufacturer

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Series BPKN-12 & BPTN-12

Identifying Features

BPKN-12 is key (post) & BPTN-12 is toggle operated pin index soft seated valves with two-piece stem construction. The design is used for medical gas cylinders with Yoke connection for filling & discharge.

The upper & lower stem interface with a square drive. The threads are located on the lower stem & the upper stem is free-floating. The design uses O-ring to create a seal around the upper stem. PEEK thrust washer is capsuled with the upper stem & acts as an anti-friction ring when the upper stem rotates to open & close the valve under high pressure. Any leakage past the packing nut metallic sealing due to external impact on the packing nut is prevented by packing nut O-ring. The lower stem has PA 66 seat insert to ensure low torque closure. The design does not use any fluorinated polymer whose by-products of combustion are toxic.

Valves are MRI approved up to 3 Tesla as per ASTM F2052-15. Markings, where provided, to indicate safety in the Magnetic Resonance Environment is as per ASTM F2503-13. *

Recommended Opening Procedure

It is recommended that the valves always be opened gradually in anticlockwise direction. Opening the valve fully causes the lower stem to ride upwards on its threads until it contacts the upper stem. Valves in fully open position can be mistaken as closed by inexperienced or untrained operators. The operator should always check the valve's position by attempting to close the valve, never by trying to open the valve.

Recommended Closing Procedure

Close the cylinder valve by rotating the key / toggle in the clockwise direction.

Valve Installation

1. Follow ISO 13341, where applicable, for valving procedure & torque guidelines.
2. For NGT threads, use hand tight + 3 turns wrench tight to install the valve in the cylinders (Refer https://drive.google.com/file/d/1E0H1B_Z4rBb7ddQJ6R897duZPmFSzHCH/view?usp=sharing)
3. For UNF threads, use valve installation torque as below:

Inlet connection	Nm	ft.lb
0.750-16 UNF-2A	80-100	60-75
1.125-12 UNF-2A	100-130	75-95

⚠ CAUTION

1. Ensure valving tools (e.g. sockets or jaws) are not in contact with the PRD.
2. Valves should not be over-torqued into the cylinder to avoid high stresses leading to overload failures, especially in parallel thread valves.
3. Do not overtorque the valve in open or closed direction.
4. Do not attempt to replace soft seat in the lower stem.
5. Repair & maintenance shall be carried out by trained personnel.
6. Yokes used for filling & discharge shall only come in contact with the intended sealing surface.

** Markings indicate safety of the valves in Magnetic Resonance Environment and it should not be construed to be applicable for the full cylinder package. It is the responsibility of the user to ensure that the cylinder as well as other fittings are also approved and marked for MRI environment.*

Series BPTN-12 (Toggle Operated Valve)

Valve shown with Taper Inlet & CG-1 PRD

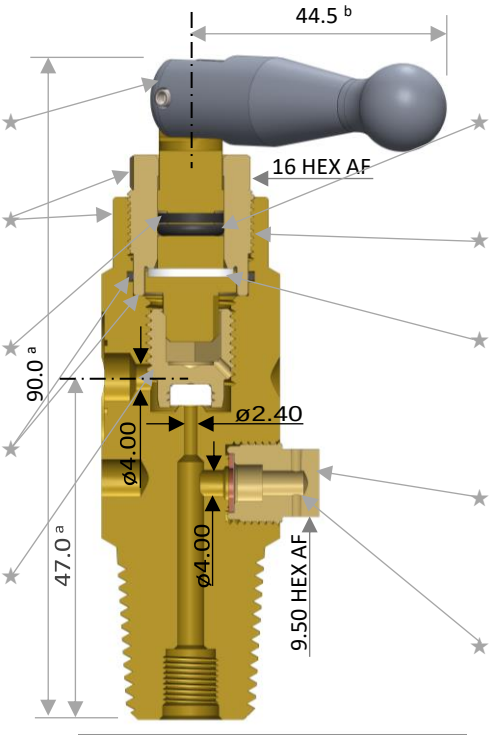
Toggle machined from high strength Aluminium alloy

Valve body and packing nut are nickel chrome plated. Gas wetted area are not plated to eliminate any flaking during service

High durometer EPDM Back-Up Ring prevents extrusion of O-ring

Metallic sealing prevents leakage past packing nut threads. Packing nut O-ring arrests leakage in case the metallic sealing is compromised by impact

Naval brass lower stem provides resistance to excessive torque



EPDM O-ring provides external tightness past upper stem over entire operating & storage temperature & pressure range

Packing nut is installed in compressive stress to reduce chance of stress corrosion cracking

PEEK thrust washer is capsuled with the upper stem & serves as an anti-friction ring during operation. It also protects the O-ring from extrusion & wear at high pressures

Capsule design PRD uses corrosion resistant Nickel burst disc and copper gasket to secure sealing with valve body & protect damage in service

PRD flow path is in a plane parallel to the longitudinal axis of the cylinder to balance the thrust forces to eliminate cylinder tipping over

All dimensions are in mm

Dimensions shown are for 17E inlet

a Depends upon inlet connection

b Also available in short toggle (length – 34.5)

Design Specifications

	Metric	English
Minimum life	2000 cycles	
Pressure rating	250 bar	3625 psig
Oxygen pressure surge test	20 cycles at 250 bar	20 cycles at 3625 psig
Temperature range	–46 °C to +85 °C	-51 °F to +185 °F
Flow coefficient (C_v)	0.16	
Minimum closing torque	2 Nm	1.5 ft.lb
Packing nut installation torque	50 Nm	37 ft.lb
PRD installation torque* - CG-1 - CG-4	 16 Nm 7 Nm	 12 ft.lb 5 ft.lb
Lubricant	Gleitmo 599	
MAX weight of cylinder package mass for which valve can be used without protection	22.2 kg	49 lb

**Optional*

Testing & Certification

- Valves meet EN ISO 10297:2017 & CGA V-9:2019
- Valves are certified by BAM to European Transportable Pressure Equipment Directive (TPED) & available with ᵀᵀ mark
- All valves are MRI approved up to 3 Tesla as per ASTM F2052-15 & stamped as per ASTM F2503-13
- PRD complies with CGA S-1.1
- Production testing as per EN ISO 14246/CGA V-9

Series BPKN-12 (Post-type Valve)

Valve shown with Parallel Inlet & CG-4 PRD

Valve body and packing nut are nickel chrome plated. Gas wetted area are not plated to eliminate any flaking during service

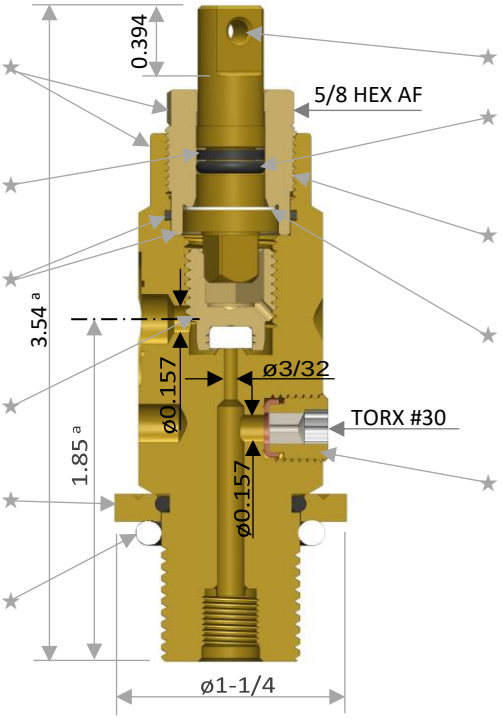
High durometer EPDM Back-Up Ring prevents extrusion of O-ring

Metallic sealing prevents leakage past packing nut threads. Packing nut O-ring arrests leakage in case the metallic sealing is compromised by impact

Naval brass lower stem provides resistance to excessive torque

Secondary flange O-ring for 3/4-16UNF inlet ensures improved sealing with cylinder neck thread

PTFE O-ring ensures leak proof seal with cylinder neck



Drill hole allows provision for toggle fitment

EPDM O-ring provides external tightness past upper stem over entire operating & storage temperature & pressure range

Packing nut is installed in compressive stress to reduce chance of stress corrosion cracking

PEEK thrust washer is capsuled with the upper stem & serves as an anti-friction ring during operation. It also protects the O-ring from extrusion & wear at high pressures

CG-4/5 capsule design PRD is flushed against the valve body to prevent damage from impact and uses corrosion resistant Nickel disc and copper gasket to provide secure sealing with valve body
(For CG-1 design, refer page -4)

All dimensions are in inch

Dimensions shown are for 3/4-16 UNF 2A inlet

a Depends upon inlet connection

Design Specifications

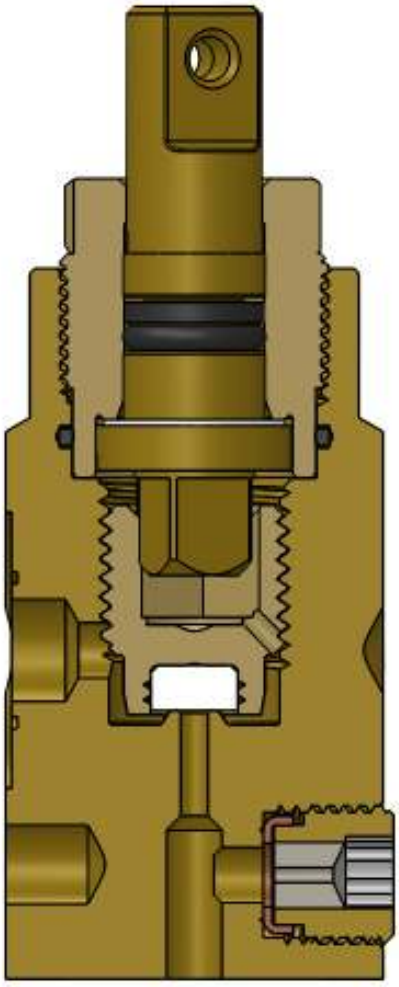
	Metric	English
Minimum life	2000 cycles	
Pressure rating	250 bar	3625 psig
Oxygen pressure surge test	20 cycles at 250 bar	20 cycles at 3625 psig
Temperature range	–46 °C to +85 °C	-51 °F to +185 °F
Flow coefficient (C_v)	0.16	
Minimum closing torque	2 Nm	1.5 ft.lb
Packing nut installation torque	50 Nm	37 ft.lb
PRD installation torque* - CG-1 - CG-4	 16 Nm 7 Nm	 12 ft.lb 5 ft.lb
Spindle failure torque	22-24 Nm	16-18 ft.lb
Lubricant	Gleitmo 599	
MAX weight of cylinder package mass for which valve can be used without protection	22.2 kg	49 lb

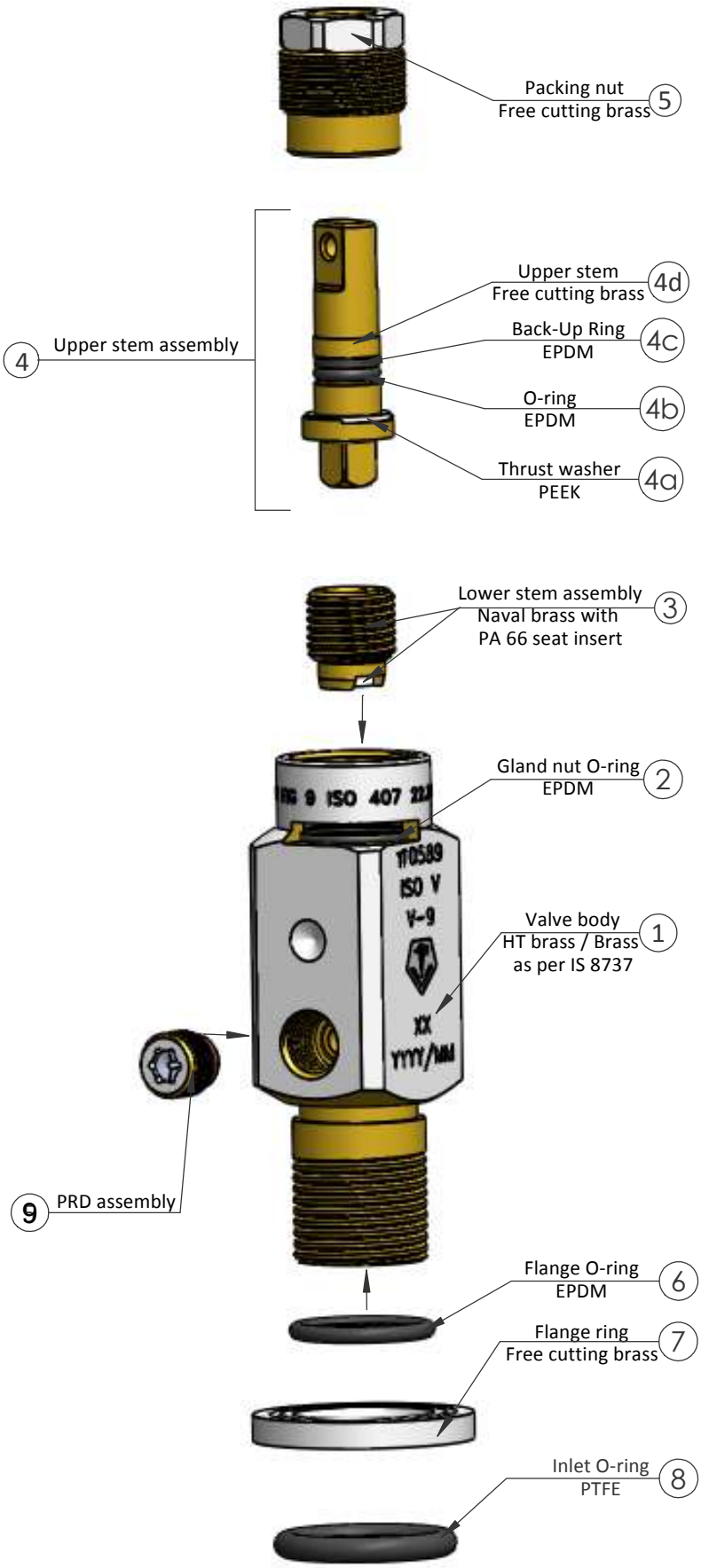
**Optional*

Testing & Certification

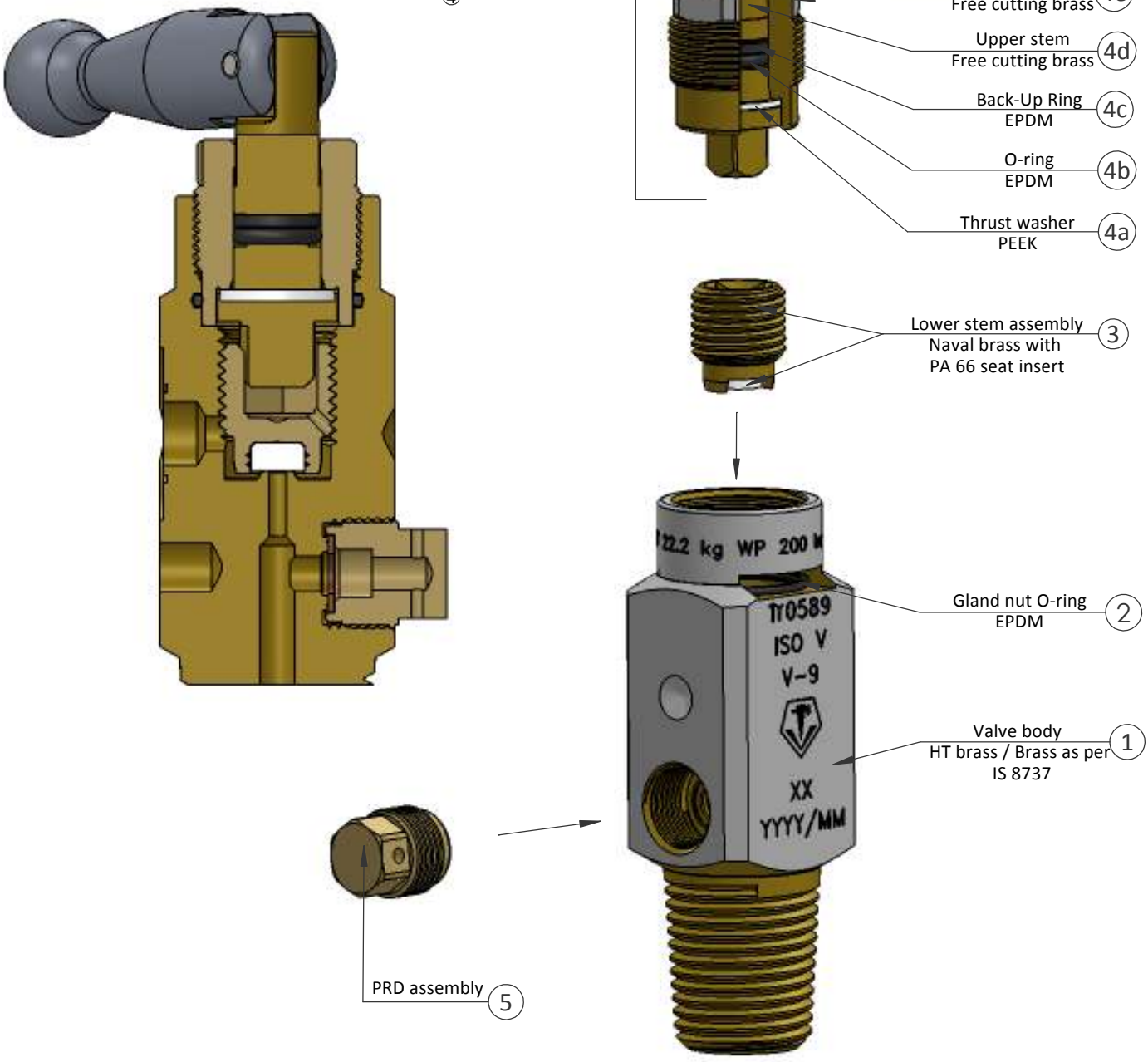
- Valves meet EN ISO 10297:2017 & CGA V-9:2019
- Valves are certified by BAM to European Transportable Pressure Equipment Directive (TPED) & available with ᵀᵀ mark
- All valves are MRI approved up to 3 Tesla as per ASTM F2052-15 & stamped as per ASTM F2503-13
- PRD complies with CGA S-1.1
- Production testing as per EN ISO 14246/CGA V-9

Series BPKN-12 (Post-type Valve)
Valve shown with Parallel inlet and CG-4 PRD





Series BPTN-12 (Toggle Operated Valve)
Valve shown with Taper inlet and CG-1 PRD



Disassembly of Valve

1. Place the valve in a vice with soft jaws. The holding fixture must securely grip the valve body (1) on the wrench flats so that there is no damage to the valve body surface, internal bores, PRD, inlet and outlet threads.
2. Using a 16 mm socket wrench, unscrew the packing nut (4e/5) in counter clockwise direction.
   For post-type valve, upper stem assembly (4), i.e., upper stem (4d), O-ring (4b), Back-Up Ring (4c) and thrust washer (4a) will remove with the packing nut (5).
   For toggle operated valves, packing nut assembly (4) toggle (4g) with pin (4f), upper stem, O-ring, Back-Up Ring and thrust washer will remove with the packing nut (4e).
3. Use the upper stem square to remove the lower stem assembly (3) from the valve chamber, by rotating it counter clockwise.
4. Remove the PRD (5/9) (if necessary) using 9.50 mm socket wrench or HEX box wrench (for CG-1) or T-30 TORX star tool (for CG-4) by rotating in counter clockwise direction.

Inspection of Valve & Components

1. Valve body (1)
   a. Blow, using dry compressed air or Nitrogen, valve body (1) internal surfaces to remove any dirt or foreign particles.
   b. Inspect the valve body for seat damage and thread wear.
   c. Inspect if packing nut O-ring (2) is in place inside the valve body groove.
   d. Do not attempt to repair the valve body if damaged.
2. Components
   a. Inspect all parts visually for wear, damage. Replace parts as necessary. In case of damage to any part of upper spindle assembly (4)/packing nut assembly (5), replace with new packing nut/upper spindle assembly.
   b. Inspect lower stem (3) threads and soft seating for any sign of wear / damage. Replace if necessary.
   c. Inspect PRD (5/9) [if installed] for any damage.
   d. For parallel inlet connection, replace inlet O-ring (8) once valve is removed from the cylinder.

Assembly of Valve

1. Fit packing nut O-ring (2) inside the groove provided in the valve body (1) just below the packing nut threads.
2. Place the lower stem assembly (3) into the valve body. Engage the upper stem square with the lower stem square and screw in packing nut / upper spindle assembly (4) into the valve body by rotating the upper stem flats. This will also drive the lower stem assembly to rest with the valve body seat.
3. Clamp valve body in bench vice between nylon clamps. Tighten packing nut assembly at 50 Nm in clockwise direction using 13/16” socket wrench.
4. Use 9.50 mm socket wrench or HEX box wrench (for CG-1) or T-30 TORX star tool (for CG-4) for tightening PRD assembly (5/9), if applicable. For CG-1 device, tighten at 16 Nm and for CG-4 device, tighten at 7 Nm in clockwise direction.
5. For parallel inlet connection, fit flange O-ring (6) in the groove provided above the inlet thread, fit the flange ring (7) below the flange O-ring and place the inlet O-ring (8) so that it rests against the flange ring.

NOTE Refer “Material of construction and assembly arrangement” page to identify the part No. given in the bracket.

Series BPTN-12 & BPKN-12

Valve Series	
BPT	BPTN-12 (Toggle) *
BPK	BPKN-12 (Key)

Body	
HT	HT brass (CP)
FP	Bras to IS 8737 (CP)

Inlet [A]	
18T	18T to BS 341-1
17E	17E to ISO 11363-1
08N	1/2-14 NGT to CGA V-1
1BS	1" to BS 341-1:1962
25E	25E to ISO 11363-1
12N	3/4-14 NGT to CGA V-1
U12	3/4-16 UNF to JIS B 8246

Gas Service		Outlet No.	
		CGA V-1	ISO 407
O2	Oxygen	870	9
He	Helium	930	11
CO	Carbon dioxide	940	16
Ai	Air	950	17
NT	Nitrogen	960	18
NO	Nitrous oxide	910	13
ON	50% N2O + 50% O2	965	8
FC	Non-flammable, Non-corrosive gas mixtures	973	A-J

Dip Tube	
X	Not required
j	M6 X 1.0
f	M8 X 0.75

Specification	
C	EN ISO 10297:2017 & CGA V-9:2019

Inspection	
P	"Pi" mark (In-house inspection service)

Test Pressure	
TP	Valve test pressure (TP)
WP	Valve working pressure (WP)

BPT	HT	17E	X	407	O2	X	XX	C	P	6	WP	200

(For example only)

Outlet [A]	
407	ISO 407
CGA	CGA V-1
A24	AS 2473-3

PRD Type	
1	CG-1/Ni
4	CG-4/Ni
8	CG-5/Ni
X	Not required

PRD Rating		
	In bar	In psig
28	207	3000
32	232	3360
36	250	3775
38	276	4000
39	300	4350
XX	Not required	

Seat Insert	
6	PA 66

Pressure Rating (in bar)	
180	180 bar
190	190 bar
200	200 bar
250	250 bar

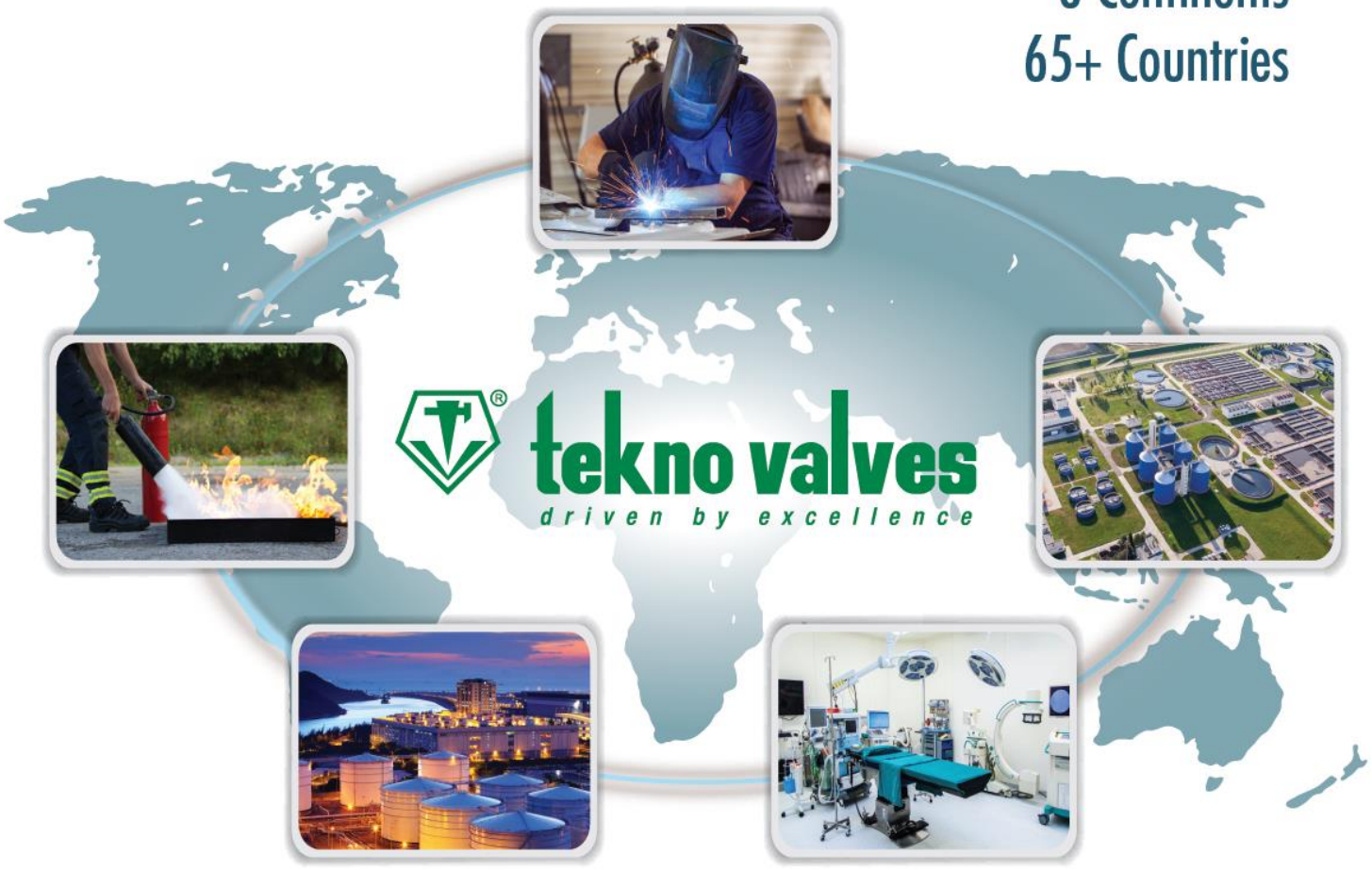
Pressure Rating (in psig)	
124	1800 psig
139	2015 psig
156	2265 psig
166	2400 psig

Options – Toggle *
Short toggle (L – 34.5 mm)
Long toggle (L – 44.5 mm)

A - Other inlet, outlet & dip tube connections are available as per customer requirement

Sl. No.	Name of Gas [A]	Chemical Formula	Outlet Connection	
			ISO 407	CGA V-1
01	Air	-	FIG 17	CGA 950
02	Carbon dioxide (with & without draw-off) & Carbon dioxide / Oxygen (CO_2>7%)	CO_2	FIG 16	CGA 940
03	Helium & Helium / Oxygen (O_2 ≤20%)	He	FIG 15	CGA 930
04	Nitrogen	N_2	FIG 18	CGA 960
05	Nitrous Oxide (with & without draw-off)	N_2O	FIG 13	CGA 910
06	Oxygen	O_2	FIG 9	CGA 870
07	Oxygen / Carbon dioxide (CO_2 ≤7%)	$O_2 + CO_2$	FIG 10	CGA 880
08	Oxygen / Helium (He ≤80%)	O_2 + He	FIG 11	CGA 890
09	50% Oxygen / 50% Nitrous Oxide (47.5% <N_2O <52.5%)	$O_2 + N_2O$	FIG 8	CGA 965
10	Non-flammable, non-corrosive gas mixtures labelled as drugs or medical devices and not having another connection assignment	-	FIG 4 (AJ)	CGA 973

6 Continents
65+ Countries



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