SUBMITTAL COVER SHEET

DATE:	X	NEW SUBMITTAL	0430105-209
9/30/2016		RESUBMITTAL	

TO:	(Owner) Arlington County: 3201 S. Eads Street Arlington, VA 22202 (Architect) STV, Inc. - 2722 Merrilee Dr. Suite 350 Fairfax, VA 22031 (Engineer) Atkins N. America, Inc. - 2318 Mill Rd., Suite 1040 Alexandria, VA 22314	FROM:	W. M. SCHLOSSER CO., INC. 2400 51ST PLACE HYATTSVILLE, MD 20781
ATTN:	Rami Natour, Jeremy Jenkins, Patrick Standiford, George Clark		

ART Bus Facility and Streetscape Improvements
Contract Agreement 722-15

ITEM NO.	DESCRIPTION OF ITEM SUBMITTED	Subcontractor, Manufacturer, Supplier	PROJECT SPEC SECTION	REVIEW CLASSIFICATION: A/E=ARCHITECT/ENGINEER/MIN APPROVAL I=INFORMATION ONLY	NO. OF COPIES P=PAPER E=ELECTRONIC
	CNG Facility and Operations	Subcontractor, Manufacturer, Supplier	Spec. #	A/E	1E
	CNG - Defuel Panel O&M Manual	(Sub)Clean Energy	0430105	A/E	1E

Clarifications, Deviations and Comments:

This is a preliminary submittal only. Final O&M manuals will be submitted as a package per spec section 017823 - Operational and Maintenance Data. - CC, WMS

I HEREBY CERTIFY THAT THE EQUIPMENT, MATERIAL AND/OR ARTICLE SHOWN/MARKED IN THIS SUBMITTAL IS IN COMPLIANCE WITH THE CONTRACT DRAWINGS AND SPECIFICATIONS, CAN BE INSTALLED IN THE ALLOCATED SPACES AND IS APPROVED FOR USE.

NAME AND SIGNATURE OF CONTRACTOR

Chris Chapman, WMS

********** THIS SECTION FOR OWNER / ARCHITECT / ENGINEER USE ONLY **********

NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY

NAME: _____

TITLE: _____

SIGNATURE: _____

DATE IN:

DATE OUT:

ACTION TAKEN BY CONSTRUCTION MANAGER (CHECK APPLICABLE BOX):

_____ APPROVED (A)

_____ APPROVED AS NOTED (AAN)

_____ DISAPPROVED, REVISE AND RESUBMIT (RR)

_____ INFORMATION ONLY/NOT REVIEWED (FIO)

ANGI Defueling Panel

Operator & Maintenance Manual

K01-50-033

REV. 01

Table of Contents

CAUTION

Compressed gasses can be dangerous if careless handling practices are used.

- When depressurizing a system keep fingers and hands away from the gas stream. High-pressure gasses can penetrate skin.

Natural gas can be explosive.

- Never use any open flame in close proximity to natural gas.
- Do not operate any systems with any electrical panel open.
- Observe all safety procedures set forth by your employer.
- Do not open energized electrical panels when gas is present.

Operate high-pressure valves with caution.

Set-up and Operational Adjustments

This panel shall only be installed and serviced by qualified personnel

It is important to periodically check the panel for leaks. New panels can develop leaks in shipping and installation. **Never tighten any fittings when compressor is running or panel is pressurized.**

No adjustments are required in this panel.

Maintenance

Leaks: Leaks can and do occur. To repair leaks depressurize the system and perform necessary steps to repair leaks.

Gauges: Over time, liquid filled gauges can lose some of its glycerin fill. Glycerin can be purchased at a local pharmacy and topped off through the rubber fill stopper on the top of the gauge.

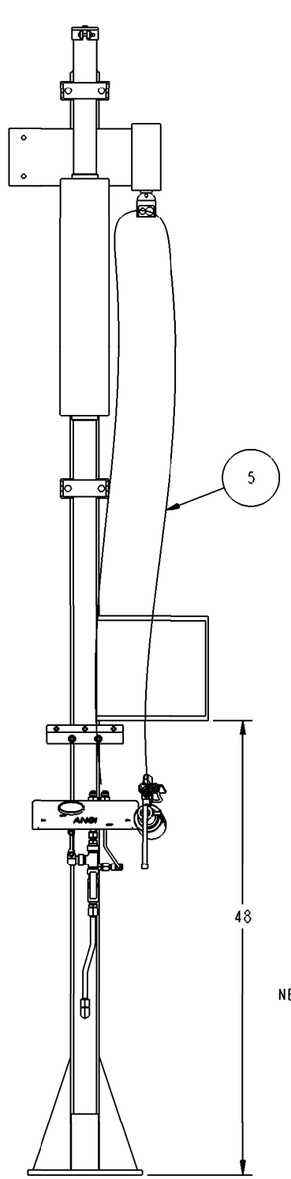
NOTES:

1. DIMENSIONS AND TOLERANCES IN ACCORDANCE WITH ASME Y14.5M-2009.

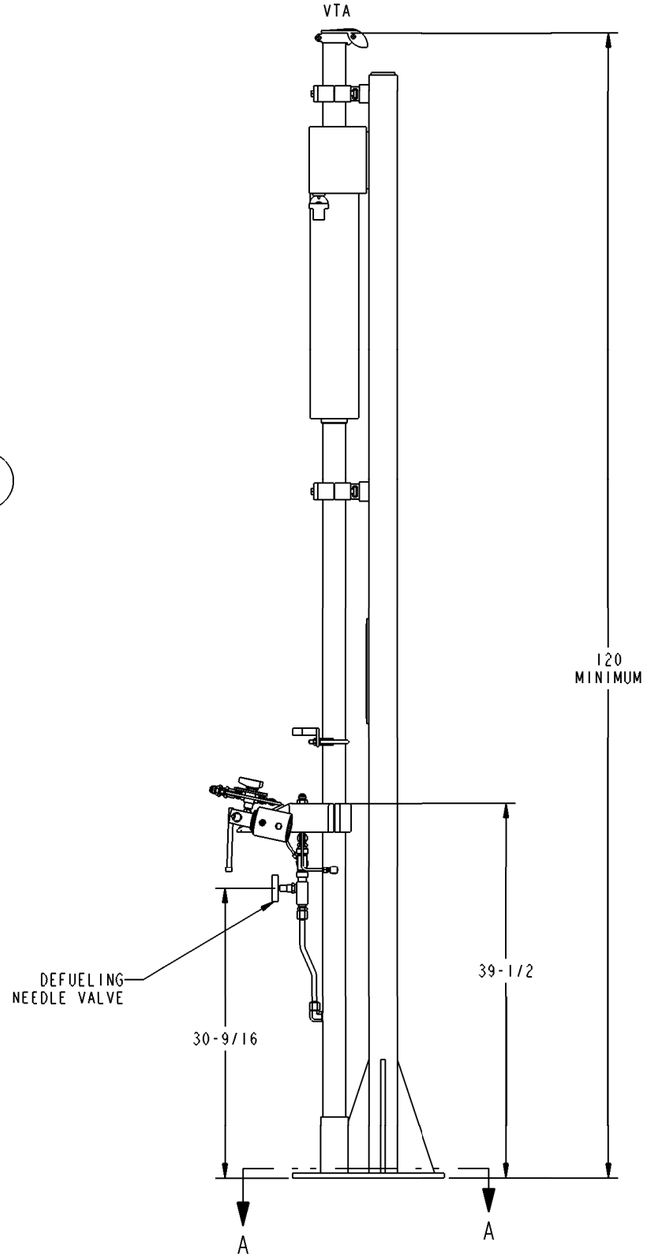
2. DESIGNED, TESTED, AND BUILT IN ACCORDANCE WITH ASME B31.3, LATEST EDITION.

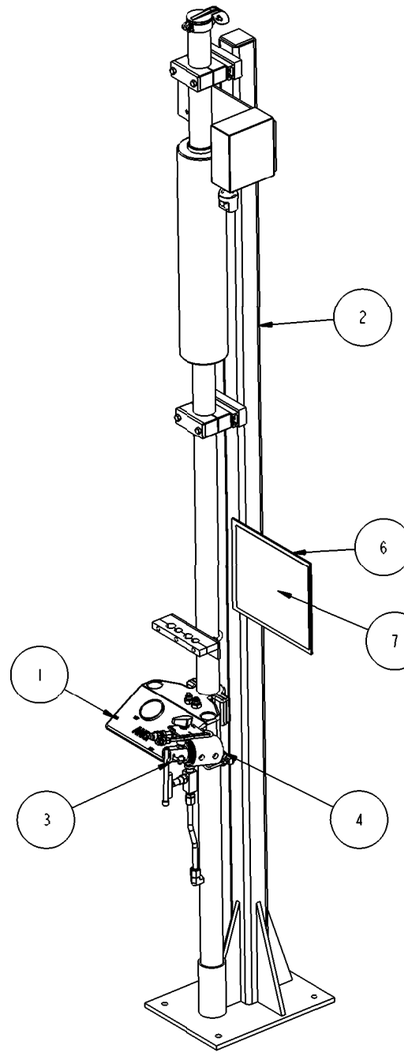
3 ATTACH SIGN PLATE TO POST WITH (3) 1/4-20 BUTTON HEAD SCREWS.

ITEM	QTY	NAME	DESCRIPTION
1	1	K01-50-033	DEFUEL PANEL 1/"2 MANUAL W/2" SILENCER VTA
2	1	B01-81-203	SUPPORT-DEFUEL PANEL W/SILENCER 2"PIPE
3	1	N50-30-083	NOZZLE ASSY-DEFUEL BDN 1/2x1/2 JIC 37-DEG
4	1	N50-60-069	HOSE ACCESSORY KIT-DEFUELING POST BDN-1000 NOZZLE HOLDER (802-07302)
5	1	N50-28-001-016	HOSE ASSY-1/2x3/8x15'-0" OAL PARKER JIC 37-DEG W/SNAPTITE - DEFUEL ONLY
3 6	1	032-07250	ALUM-SHEET .190x11x13 6061
7	1	791-07485	SIGN-DEFUELING PANEL 10x12 PER ANSI Z535.4-2011 FOR DEFUEL W/BDN TO ATMOSPHERE



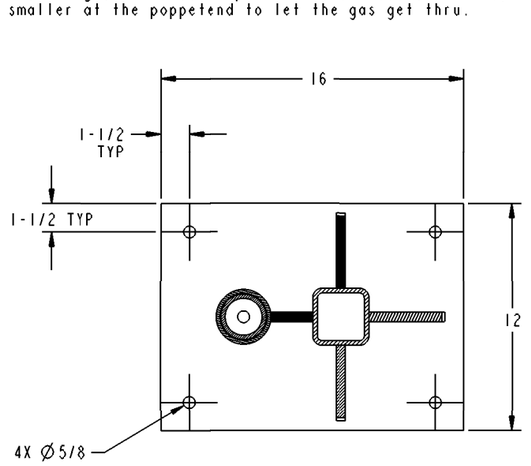
VTA





(IF THE NOZZLE DOES NOT DEFUEL THE RECEPTACLE CORRECTLY, UNSCREW THE CAP ON THE HANDLE. LOCATED INSIDE, WILL BE A LITTLE BRASS ADAPTER. PLACE ADAPTER IN THE RECEPTACLE. THIS SHOULD CREATE ENOUGH SPACE TO PUSH THE CHECK VALVE BACK ON THE RECEPTACLE & PROPERLY DEFUEL.

***NOTE: SEE BELOW WHY IT WILL NOT DEFUEL A STAUBLI RECEPTACLE. A PLUNGER MUST BE MADE.
In order to use the OPW defueling device, (BDN), with a Staubli receptacle you must have a plunger fitting that is long enough to reach the poppet inside the receptacle body plus about 1/16th" to 3/32" to allow the poppet to be be opened and let the gas flow backwards. OPW does not supply this. The BDN was designed for engagement with all receptacles originally but Staubli put their poppet further back. Make this adaptor large enough to fit through the entrance to the poppet and long enough to depress it backwards for gas flow. Use a piece of stainless steel rod, a little smaller at the poppetend to let the gas get thru.



SECTION A-A
(MOUNTING LOCATIONS
SCALE 0.250

REV	DATE	APPROVED	DESCRIPTION
A	03/11/2016	WPINN	ADD DIMENSION FOR SIGN

ANGI ENERGY SYSTEMS
305 W MCLEAN DR
JANESVILLE, WI 53546
PH: 608-563-2000
www.angienergy.com

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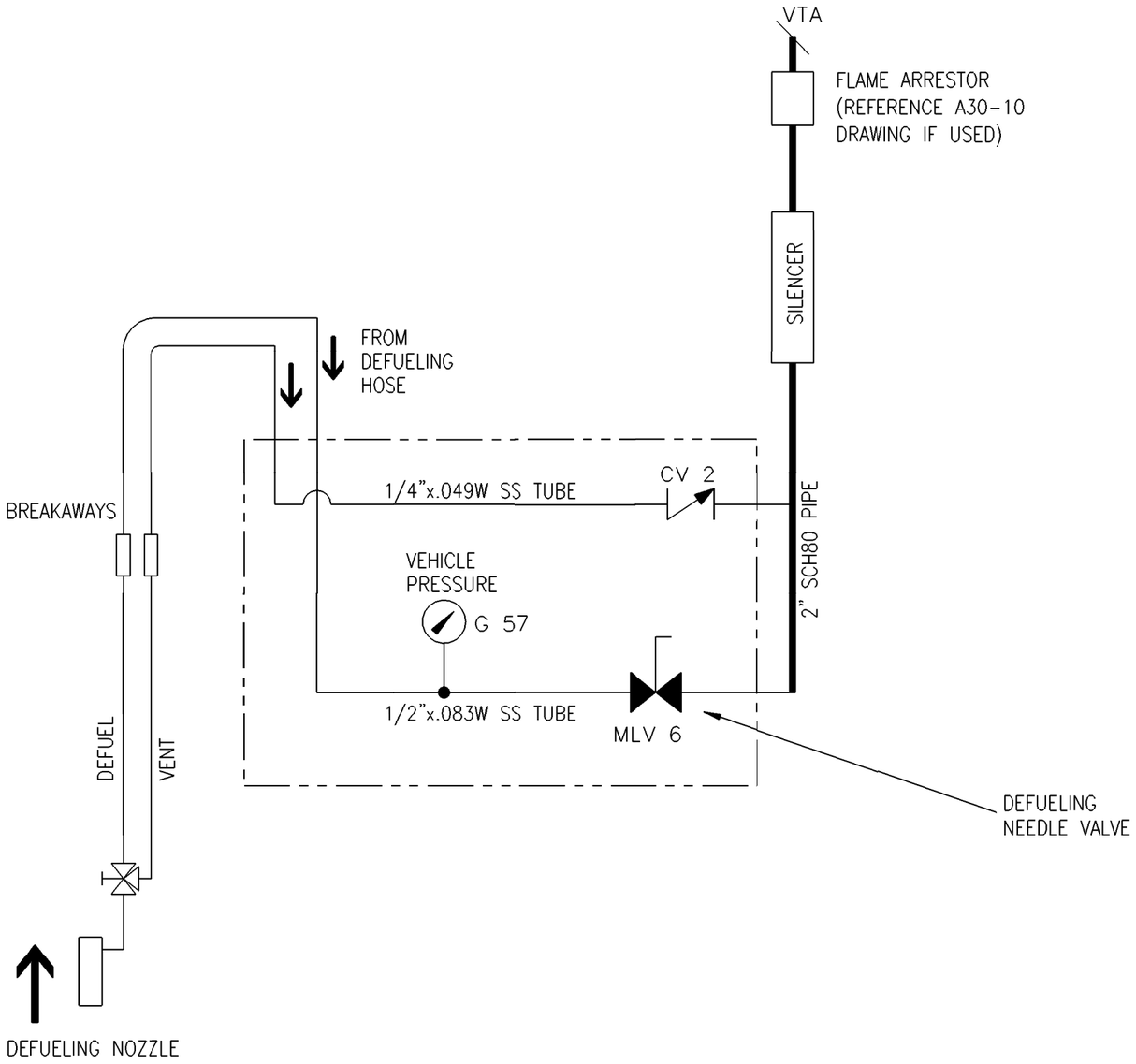
UNLESS OTHERWISE SPECIFIED
BREAK SHARP EDGES .005 +.015
ALL DIMENSIONS IN INCHES
FRACTIONAL ± 1/6
TWO PLACE DECIMAL ± .010
THREE PLACE DECIMAL ± .005
ANGLES ± 1°

TITLE: ASSY-DEFUEL PANEL MANUAL 2"SILENCER VTA BDN
CUSTOMER
PROJECT NO
SHEET: 1 of 1
SCALE: 0.125
DRAWING NO: A30-10-039-01
REV: A
DRAWN BY: M.PINNOW
DATE: 01/11/2016

DESIGNATOR	PART NUMBER	DESCRIPTION
CV 2	336-02419	VALVE-CHECK HOKE 1/4 ML 6000# 2# SPRING
G 57	741-07289	GAUGE-PRES 10,000#/B BM PM CF WIKA 1/4" MNPT, 2-1/2" DIA FACE
MLV 6	338-07233	VALVE-NEEDLE 1/2 MLxFML 6000# KF TEFLON PACKING SEAL



REV	DATE/BY	DESCRIPTION	REV	DATE/BY	DESCRIPTION
A	04/15/16 MPINN	ADD FLAME ARRESTOR			

ANGI ENERGY SYSTEMS
305 W DELAVAN DR
JANESVILLE, WI 53546
PH: 608-563-2800
www.angienergy.com

UNLESS OTHERWISE SPECIFIED

BREAK SHARP EDGES .005-.015

ALL DIMENSIONS IN INCHES

FRACTIONAL	± 1/8
TWO PLACE DECIMAL	±.010
THREE PLACE DECIMAL	±.005
ANGLES	±1°

TITLE	DEFUELING PANEL 1/2" MANUAL W/2" SILENCER VTA				
CUSTOMER				PROJECT NO.	
DRN MDP	DATE 01/12/16	SCALE NONE		DRAWING NO. PID-K01-50-033	REV. A
CHK	DATE	SHT 1	TOT 1		

AUTOCAD WINDCHILL

CV 2

HOKE
6133M4Y3
1/4" MNPT CHECK VALVE 6000 PSI,
2 PSI CRACKING PRESSURE SPRING

ANGI PART NUMBER 336-02419

REBUILD KIT ASSY - 804-06816

BALL CHECK VALVE 1/4 SS 6130 SERIES – 339-06818

O'RING CHECK VALVE 6130 SERIES – 710-07377

GASKET CHECK VALVE 6130 & 6230 SERIES – 260-06819

SPRING CHECK VALVE 6100 & 6230 SERIES SS & BRASS 2 PSI – 650-06820

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Check Valves—Ball and Poppet Designs
6100–6200 Series

6133G4Y

6253F8Y

APPLICATIONS:

- Prevents reversed flow to protect solenoids, regulators and pumps
- Locks pressure in hydraulic cylinders
- Low pressure inline relief valve
- Vent valve to purge a system

Maximum Operating Pressure:
Brass Valves: 3000 PSIG @ 70°F (211 Kg/Cm² @ 21°C)
SS Valves: 6000 PSIG @ 70°F (423Kg/Cm² @ 21°C)

Operating Temperature Range:
Buna N O-ring: –40° to 200°F (–40° to 93°C)
Viton O-ring: –20° to 350°F (–29° to 177°C)
Cracking Pressure Standard: 2 PSI (.14 Kg/Cm²)

Orifice Sizes: .187" (4.75mm), .422" (10.7mm)

Cv Factor: 0.3, 2.4

MATERIALS OF CONSTRUCTION

	Ball Type			Poppet Type
	Brass Valves	316SS Valves	Monel	316SS
Body	Brass	316SS	Monel	316SS
Ball or Poppet	302SS	316SS	Monel	316SS
Spring	302SS	316SS	Monel	316SS
O-ring seat	Buna N	Viton	Viton	Viton Buna N*
Gasket (Body)	Mylar	Teflon	Teflon	Teflon Buna N*

**For poppet check valves with ⅜ and ½ NPT female connections.*

BALL CHECK VALVES	ORDER BY NUMBER			
A & B Connections	Brass Valves	Monel	316 SS Valves	Orifice
1/8 NPT Female	6113F2B	—	6133F2Y	.187
1/8 NPT Male	6113M2B	—	6133M2Y	.187
1/4 NPT Female	6113F4B	—	6133F4Y	.187
1/4 NPT Male	6113M4B	—	6133M4Y	.187
1/4 Gyrolok	6113G4B	6133G4M	6133G4Y	.187
3/8 Gyrolok	6113G6B	6133G6M	6133G6Y	.187
1/4 NPT Male x 1/4 Gyrolok	6113H4B	—	—	.187
6MM Gyrolok	—	—	6133G6Y/MM	.187

POPPET CHECK VALVES	ORDER BY NUMBER	
A & B Connections	316 SS Valves	Orifice
1/4 NPT Female	6233F4Y	.187
1/4 NPT Male	6233M4Y	.187
1/4 Gyrolok	6233G4Y	.187
3/8 Gyrolok	6233G6Y	.187
1/2 NPT Female	6253F8Y	.422
1/2 Gyrolok	6253G8Y	.422

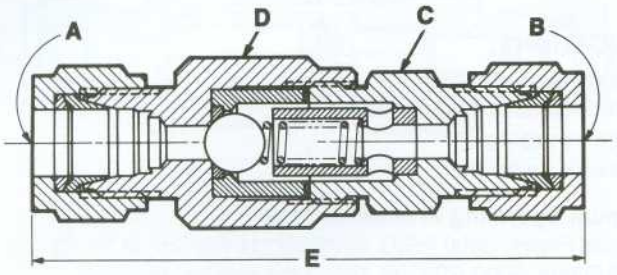
FEATURES:

- O-ring seat provides leak-tight shut-off.
- Internal design guides flow around or inside spring, not through coils, when valve is open.
- All models are tested in production to assure a leak-tight body joint and seat.
- Ball & Poppet designs are available as standard.
- Ball type provides effective leak-tight closure with minimum flow resistance.
- Poppet models provide large flows with a minimum of chatter and fluctuation.
- Valves are available with various cracking pressures, from 1/3 to 25 PSI.
- 2-piece body permits interchangeability of end connections.

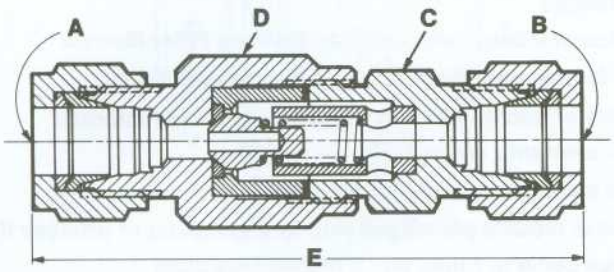
OTHER DIFFERENTIAL CRACKING PRESSURES

All check valves except 3/8 and 1/2 NPT female models can be furnished with other than 2 PSI cracking pressures. To order, change the fourth digit (3) of the desired valve part number as follows: Example: 6115G4B would have 10 PSI cracking pressure.

Cracking Pressure	Fourth Digit
1/3 PSI	"1"
10 PSI	"5"
25 PSI	"6"



6133G4Y
BALL TYPE

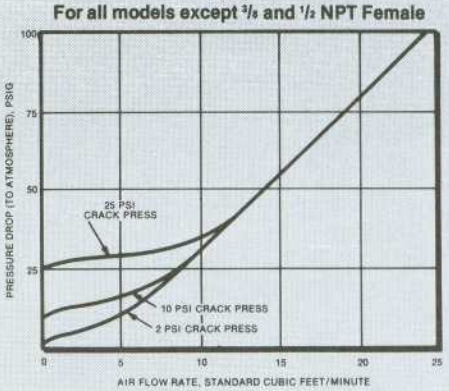


6233G4Y
POPPET TYPE

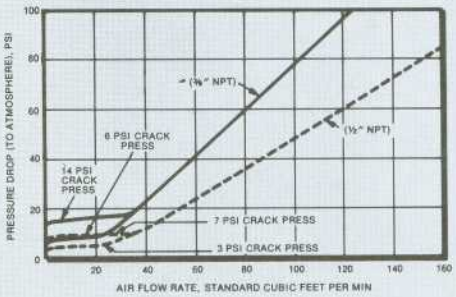
DIMENSIONS

Type	A & B Connections		C (Hex)	D (Hex)	E
Ball	1/8 NPT Female	mm	17	19	60
		inch	11/16	3/4	2 3/8
	1/8 NPT Male	mm	17	19	60
		inch	11/16	3/4	2 3/8
	1/4 NPT Female	mm	19	19	64
		inch	3/4	3/4	2 1/2
	1/4 NPT Male	mm	17	19	60
		inch	11/16	3/4	2 3/8
	1/4 NPT Male 1/4 Gyrolok	mm	17	19	70
		inch	11/16	3/4	2 3/4
	6MM Gyrolok	mm	17	19	76
		inch	11/16	3/4	3
	1/4 Gyrolok	mm	17	19	76
		inch	11/16	3/4	3
	3/8 Gyrolok	mm	25	19	79
		inch	1	3/4	3 1/8
Poppet	1/4 NPT Female	mm	19	19	64
		inch	3/4	3/4	2 1/2
	1/4 NPT Male	mm	17	19	60
		inch	11/16	3/4	2 3/8
	1/4 Gyrolok	mm	17	19	76
		inch	11/16	3/4	3
	3/8 Gyrolok	mm	25	19	79
		inch	1	3/4	3 1/8
	1/2 Female	mm	32	32	89
		inch	1 1/4	1 1/4	3 1/2

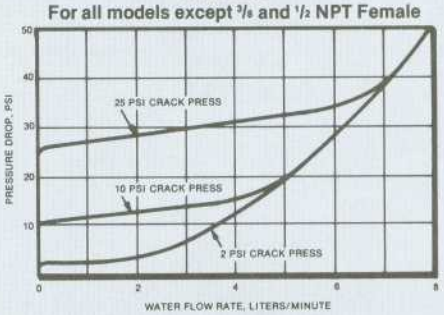
AIR
For all models except 3/8 and 1/2 NPT Female



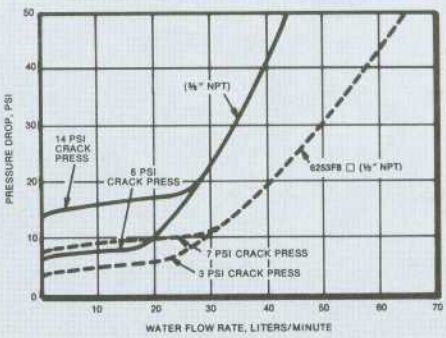
AIR



WATER
For all models except 3/8 and 1/2 NPT Female



WATER



G 57

WIKA
4272016
0-10,000 PSI/BAR PRESSURE GAUGE

ANGI PART NUMBER 741-07289

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WIKA

Industrial Gauges

Type 23X.53

Liquid Fillable

- Stainless Steel Case & Crimp Ring
- Welded Case-to-Socket Connection
- Field Liquid-Fillable

Type 232.53 - Dry case
Type 233.53 - Liquid filled case

The rugged construction of WIKA Type 23X.53 stainless steel gauges provides resistance to the most corrosive media and environments. These gauges feature 316 stainless steel wetted parts and a 304 stainless steel case and crimped ring, and can be liquid-filled in the field.

Standard Features

- **Nominal Case Size:** 2" (53 mm), 2½" (68 mm), 4" (100 mm)
- **Case Material:** 304 stainless steel
- **Wetted Parts:** 316 SS
- **Window Type & Material:** 2½" Polycarbonate; 4" Acrylic
- **Removable Window:** No
- **Dial Material:** White aluminum
- **Bezel Ring Type & Material:** Crimp on SS polished
- **Liquid Fillable Gauge:** Yes
- **Case-to-Socket O-ring Material:** Welded
- **"Other" Gaskets/O-ring Types & Materials:** Window gasket, BUNA-N
- **Pointer Material/Type:** Black aluminum
- **Adjustable Pointer:** No
- **Accuracy:** ±1.5% of span (2" & 2½"); (4") ± 1.0% of span-ASME B40.100 Grade 1A
- **Connection locations:** LM (Lower Mount), CBM (Center Back Mount) & LBM (Lower Back Mount) (4" only)
- **Media Operating Temperature:** 212°F
- **Ambient Operating Temperature:** -40°F to 140°F dry; -4°F to 140°F glycerine case fill; -40°F to 140°F silicone case fill

Available Options
"Dampened Movement" Option: Yes, (N/A on 2½" CBM or 2" LM/CBM) & LBM
U-Clamp Bracket: Yes (CBM only)
Front Flange: Yes (CBM & LBM only)
Rear Flange: Yes (LM, CBM & LBM)
Restrictor: Yes
Safety Glass Window: No
Instrument Glass Window (flat glass): No
Drag Pointer (maximum reading indicator): Yes
Cleaned for Use in Oxygen Service: Yes
Panel Mount Kit: Yes (see front flange or u-clamp option)
Magnetic or Inductive Contact Switches: No
Receiver Gauge Scales: Yes
Special Connection: Limited to wrench flat area

Type	232.53				
Connection	LM	CBM			
Conn. Size	1/4" NPT				
Size	2½"				
Pressure Scale[1]	PSI	PSI	PSI/BAR	PSI/KPA	PSI/KG/CM²
30" Hg	9768777	9768394			
30"-0-15 PSI					
30"-0-30 PSI	9768769	9768386			
30"-0-60 PSI	9768750	9768378			
30"-0-100 PSI					
30"-0-160 PSI	9768742	9768360			
30"-0-200 PSI					
15 PSI	9768734	9768351			
30 PSI	9768726	9768343			
60 PSI	9768718	9768335	8992848	8993089	8992962
100 PSI	9768700	9768327	8992856	8993097	8992970
160 PSI	9768696	9768319	8992865	8993101	8992988
200 PSI	9768688	9768300	8992873	8993119	8992996
300 PSI	9768670	9768297	8992881	8993127	8993004
400 PSI	9768661	9768289			
600 PSI	9768653	9768270	9779685	9779693	
800 PSI					
1,000 PSI	9768645	9768262	8992899	8993135	8993012
1,500 PSI	9768637	9768254	8992903	8993144	8993020
2,000 PSI	9768629	9768246	8992911	8993152	8993038
3,000 PSI	9768610	9768238	8992929	8993160	8993046
5,000 PSI	9768602	9768220	8992937	8993178	8993055
6,000 PSI		8993208	8992945	8993186	8993063
10,000 PSI	9768599	9768211	8992954	8993195	8993071
15,000 PSI		9779715	9776715		9779731

[1]"PSI/BAR" denotes dual scale; PSI outside in black, BAR inside in red; "PSI/KPA" denotes dual scale; PSI outside in black, KPA inside in red; "PSI/KG/CM²" denotes dual scale; PSI outside in black, KG/CM² inside in red. Note: Vacuum scale: 30" Hg outside in black; 760 mm Hg inside in red. [2]

Note: For options not shown - consult your WIKA Distributor or the Factory.

Data sheet: 23X.53

For liquid filled gauges, add "-829" to part numbers above for 2½" size or "-834" for 4" size.

Items shown with part numbers indicate readily available standard WIKA products. Items shown without part numbers are available on special order.

WIKA

Type	232.53- liquid fillable		
Connection	LM	LM	LBM
Conn. Size	1/4" NPT	1/2" NPT	
Size	4"		
Pressure Scale	PSI	PSI	PSI
30" Hg	9767576	9768459	9737057
30"-0-15 PSI	9737910	9768467	9737065
30"-0-30 PSI	9767398	9768475	9737073
30"-0-60 PSI	9767401	9768483	9737081
30"-0-100 PSI	9737898	9737880	9737090
30"-0-160 PSI	9767410	9768491	9737103
30"-0-200 PSI	9737901	9768505	9737111
30"-0-300 PSI	4260147		
30"-0-400 PSI	4260155		
15 PSI	9767428	9768513	9737120
30 PSI	9767436	9768521	9737138
60 PSI	9767444	9768530	9737146
100 PSI	9767452	9768548	9737154
160 PSI	9767460	9768556	9737162
200 PSI	9767479	9768564	9737170
300 PSI	9767487	9768572	9737189
400 PSI	9767495	9768580	9737197
600 PSI	9767509	9768963	9737200
800 PSI			9737219
1,000 PSI	9767517	9768858	9737227
1,500 PSI		9768866	9737235
2,000 PSI		9768807	9737243
3,000 PSI		9768874	9737251
5,000 PSI		9768823	9737260
10,000 PSI		9768831	9737278
15,000 PSI		9768840	9737286

Type	233.53- glycerine filled				
Connection	LM		LM	LBM	CBM
Conn. Size	1/4" NPT		1/2" NPT		1/4" NPT
Size	2½"	4"	4"		2½"
Pressure Scale	PSI	PSI	PSI	PSI	PSI
30" Hg	9833646	9833124	9833328	9831504	9833310
30"-0-15 PSI		9831775	9833336	9831512	
30"-0-30 PSI	9833638	9832993	9833345	9831520	9833302
30"-0-60 PSI	9833620	9833000	9833353	9831538	9833298
30"-0-100 PSI		9831759	9831741	9831546	
30"-0-160 PSI	9833612	9833018	9833361	9831555	9833280
30"-0-200 PSI		9831767	9833379	9831563	
30"-0-300 PSI					
30"-0-400 PSI					
15 PSI	9833604	9833026	9833387	9831571	9833272
30 PSI	9833590	9833035	9833395	9831589	9833264
60 PSI	9833582	9833043	9833409	9831597	9833255
100 PSI	9833574	9833051	9833417	9831601	9833247
160 PSI	9833565	9833069	9833425	9831619	9833239
200 PSI	9833557	9833077	9833434	9831627	9833221
300 PSI	9833549	9833085	9833442	9831635	9833213
400 PSI	9833531	9833094	9833450	9831644	9833205
600 PSI	9833523	9833107	9833727	9831652	9833191
800 PSI					
1,000 PSI	9833515	9833115	9833697	9831678	9833183
1,500 PSI	9833506		9833701	9831686	9833175
2,000 PSI	9833493		9833655	9831695	9833166
3,000 PSI	9833485		9833719	9831708	9833158
5,000 PSI	9833476		9833663	9831716	9833140
10,000 PSI	9833468		9833671	9831725	9833132
15,000 PSI			9833689	9831733	

Type	232.53- Stock Gauges with Ammonia Scales	
Size	2 ½"	4"
Connection	LM	
Conn. Size	1/4" NPT	
30"-0-150 PSI / 84°F	9797144	9797127
30"-0-300 PSI / 126°F	9797152	9797135

MLV 6

KF
15-125

1/2” FNPT x MNPT NEEDLE VALVE
6000 PSI

ANGI PART NUMBER 338-07233

NO REBUILD KIT AVAILABLE

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Table of Contents

The KF Commitment to Excellence...

For over 30 years, we at KF Industries have been dedicated to providing our customers with technically superior products that are designed for the most severe applications. Our broad range of valve designs and sizes, constructed of the highest quality materials, reliably service a diverse range of industrial and oilfield markets.

With precision engineering and manufacturing techniques, coupled with outstanding customer service, KF Industries is your source for flow control solutions.

The KF Needle Valve

KF Needle Valves are state-of-the-art valves, designed for oilfield, industrial, and comparable services where high pressure, abrasive-laden gases and fluids cause early failure of all but the most rugged equipment.

KF Needle valves combine rugged construction, dependability, and leak-free performance at high and low pressures. These valves offer exceptional regulating properties and high flow capacities in the full open position. Applications include: Liquefied petroleum gas facilities, natural gas installations, wellhead applications, and systems difficult to shut off due to solid contaminants. Valves are available with metal-to-metal or a replaceable nylon seat. Materials of construction include Carbon Steel with 316 Stainless Steel Stem, and is optionally available in all 316 Stainless Steel.

Ratings

• Soft seated valves (O-ring and Packed Style) are rated 6000 psi at 200˚F.

• O-ring metal seated valves with standard Buna N Stem Seal are rated 10,000 psi at 200˚F. Optional Viton® Stem Seal assemblies are rated up to 400˚F.

• Packed Stem metal seated valves with standard Teflon® packing are rated 10,000 psi at 200˚F. Optional HT (Grafoil) packing is rated up to 1000˚F.

Special Features

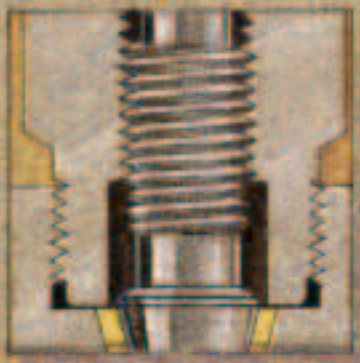
• Body: Oversized extra heavy body that resists abuse and provides utmost protection against corrosion and erosion. Precision machined seat pocket and bonnet retaining threads assure perfect alignment and sealing at bonnet/body connection and stem/seat interface. A Bonnet Locking Pin secures the bonnet and body against accidental disassembly.

• Bonnet: Precision threading, both external and internal, assure proper alignment and a sturdy leak-proof connection with the body. A metal-to-metal backseat is provided for additional stem sealing security when the valve is full open.

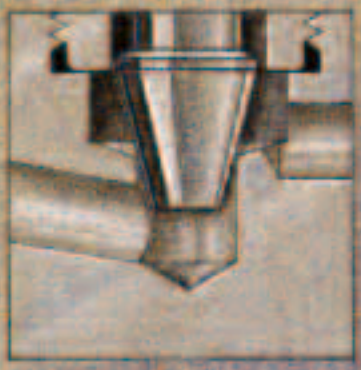
• Stem: Stem material is 316 Stainless Steel with a precision ground conical seating tip. Threads are permanently lubricated with a high quality anti-seize compound which increases service life by preventing galling and freeze up. Fourteen pitch threads provide uncompromised load bearing capacity while maintaining excellent flow regulation characteristics.

• Seat: Soft seat valves include a one piece, replaceable nylon seat with retaining lug. This lug provides absolute protection against seat failures caused by seat rotation.

Packed-Stem Style Features



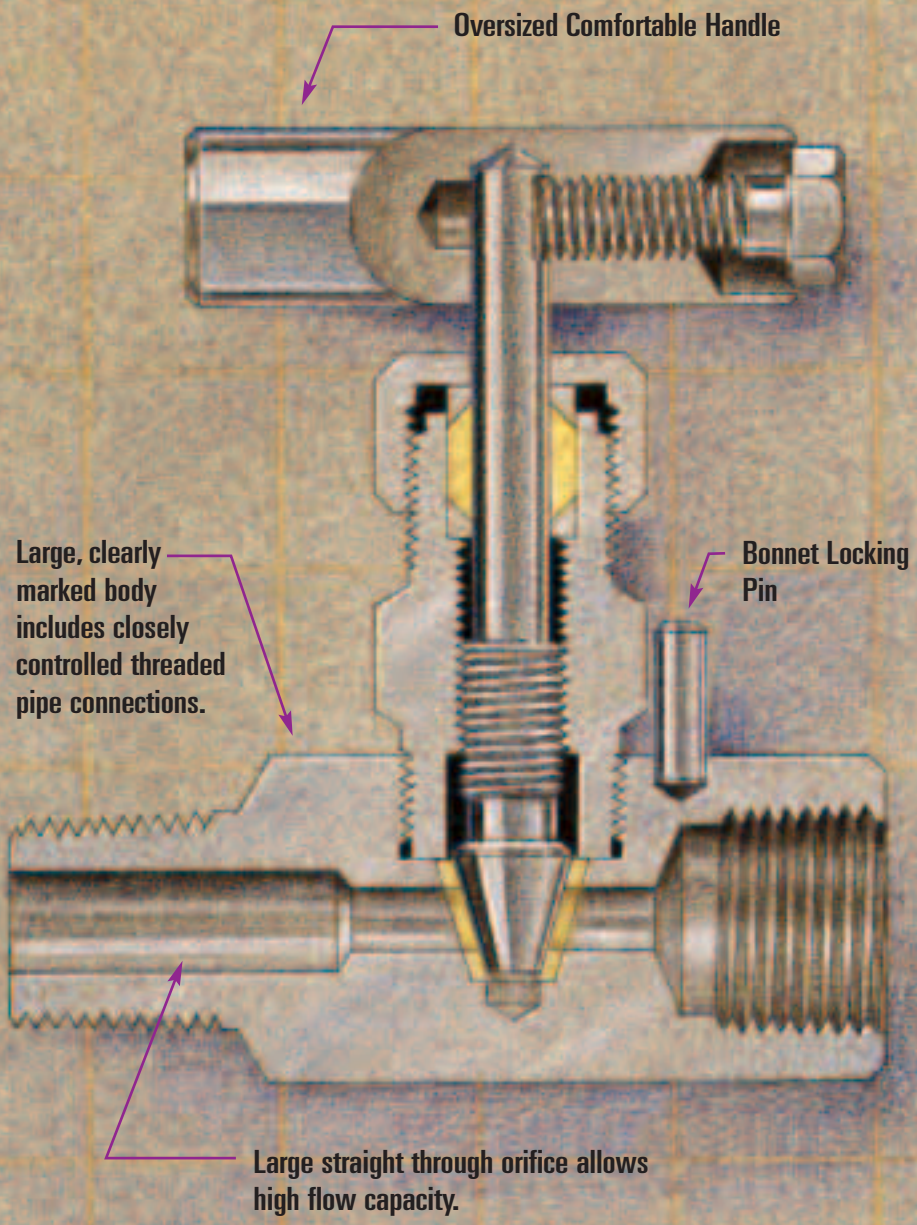
A. Back seat stem design



B. Metal-to-Metal stem seating

C. Adjustable Teflon® stem packing

D. Replaceable seat



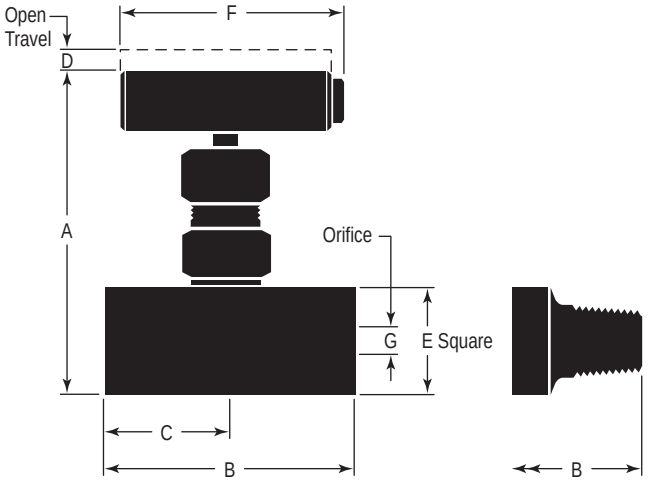
A. Back seat stem design helps prevent fire feeding leakage. High strength stem threads provide extended life and low torque operation.

B. Positive metal-to-metal stem seating arrangement in all metal seat valves assure drop-tight sealing up to 10,000 psi.

C. Inert Teflon® stem packing and micro-finish stem offer sealing dependability. Adjustable packing nut insures continuous sealing protection.

D. Tough nylon, replaceable seat in all soft seat valves is secured by an anti-rotation lug.

KF Packed-Stem Style Standard Configuration Needle Valves



Dimensional Data and Assembly Part Numbers, Series 13 & 14 Metal Seated Valve Assemblies

1/4" and 1/2" 10,000 lbs. max. WOG at 200˚F, 3/4" and 1" 6,000 lbs. max. WOG at 200˚F

Size NPT	Connections	Assembly Part Numbers			Wt. Lbs.	C_V	Dimensional Data						
		Carbon Steel	316 Stainless	NACE*			A	B	C	D	E	F	G
1/4"	Double Female	13-14	14-14	N14-14	1.65	.7	3 5/8	2 7/8	1 7/16	3/8	1 1/8	2 3/4	1/4
	Female-Male	13-145	14-145	N14-145	1.53	.7	3 5/8	3 1/4	1 7/16	3/8	1 1/8	2 3/4	1/4
1/2"	Double Female	13-12	14-12	N14-12	1.65	.7	3 5/8	2 7/8	1 7/16	3/8	1 1/8	2 3/4	1/4
	Female-Male	13-125	14-125	N14-125	1.53	.7	3 5/8	3 3/8	1 7/16	3/8	1 1/8	2 3/4	1/4
	Double Female B**	13-12B**	14-12B**	N14-12B**	1.65	.7	3 5/8	2 7/8	1 7/16	3/8	1 1/8	2 3/4	1/4
	Female-Male B**	13-125B**	14-125B**	N14-125B**	1.53	.7	3 5/8	3 3/8	1 7/16	3/8	1 1/8	2 3/4	1/4
3/4"	Double Female	13-34	14-34	N14-34	6.0	2.3	5 3/8	4 1/4	2 1/8	1/2	2	4 1/4	3/8
	Female-Male	13-345	14-345	N14-345	6.4	2.3	5 3/8	5 1/2	2 1/8	1/2	2	4 1/4	3/8
1"	Double Female	13-10	14-10	N14-10	6.0	2.3	5 3/8	4 1/4	2 1/8	1/2	2	4 1/4	3/8
	Female-Male	13-105	14-105	N14-105	6.4	2.3	5 3/8	5 1/2	2 1/8	1/2	2	4 1/4	3/8

Dimensional Data and Assembly Part Numbers, Series 15 & 16 Soft Seated Valve Assemblies

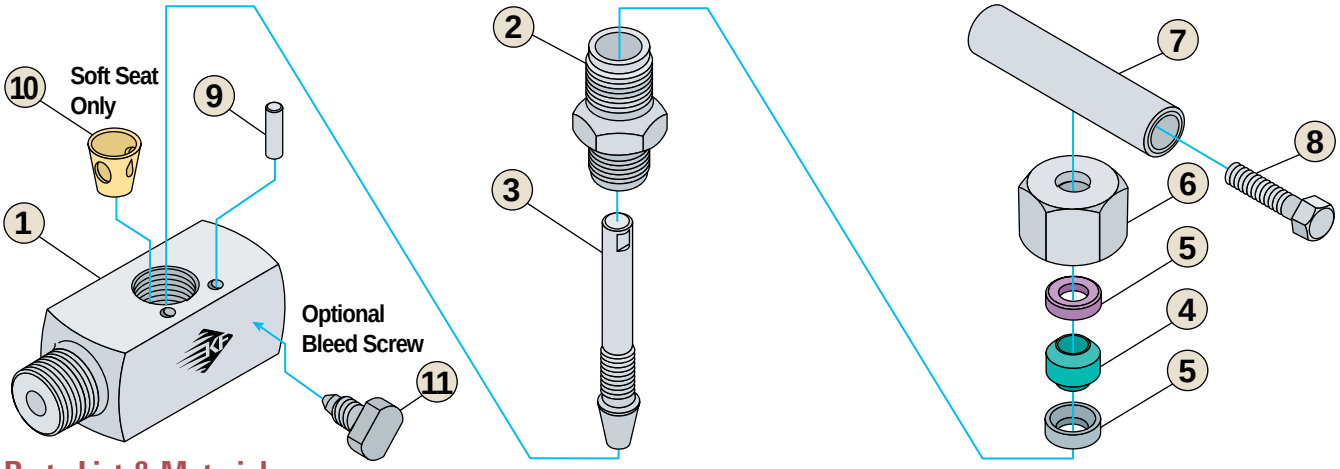
6,000 lbs. max. WOG at 200˚F

Size NPT	Connections	Assembly Part Numbers			Wt. Lbs.	C_V	Dimensional Data						
		Carbon Steel	316 Stainless	NACE*			A	B	C	D	E	F	G
1/4"	Double Female	15-14	16-14	N16-14	1.65	1.8	3 5/8	2 7/8	1 7/16	3/8	1 1/8	2 3/4	1/4
	Female-Male	15-145	16-145	N16-145	1.53	1.8	3 5/8	3 1/4	1 7/16	3/8	1 1/8	2 3/4	1/4
1/2"	Double Female	15-12	16-12	N16-12	1.65	1.8	3 5/8	2 7/8	1 7/16	3/8	1 1/8	2 3/4	1/4
	Female-Male	15-125	16-125	N16-125	1.53	1.8	3 5/8	3 3/8	1 7/16	3/8	1 1/8	2 3/4	1/4
	Double Female B**	15-12B**	16-12B**	N16-12B**	1.65	1.8	3 5/8	2 7/8	1 7/16	3/8	1 1/8	2 3/4	1/4
	Female-Male B**	15-125B**	16-125B**	N16-125B**	1.53	1.8	3 5/8	3 3/8	1 7/16	3/8	1 1/8	2 3/4	1/4
3/4"	Double Female	15-34	16-34	N16-34	6.0	5.0	5 3/8	4 1/4	2 1/8	1/2	2	4 1/4	7/16
	Female-Male	15-345	16-345	N16-345	6.4	5.0	5 3/8	5 1/2	2 1/8	1/2	2	4 1/4	7/16
1"	Double Female	15-10	16-10	N16-10	6.0	5.0	5 3/8	5 1/4	2 1/8	1/2	2	4 1/4	7/16
	Female-Male	15-105	16-105	N16-105	6.4	5.0	5 3/8	5 1/2	2 1/8	1/2	2	4 1/4	7/16

*NACE valves-Sour Gas Valve Assembly-Valves are manufactured of 316 SS. All parts RC 22 or less to meet NACE MR-01-75 standards. Working pressures same as standard valves.

**Includes Bleed Fitting

KF Packed-Stem Style Needle Valves

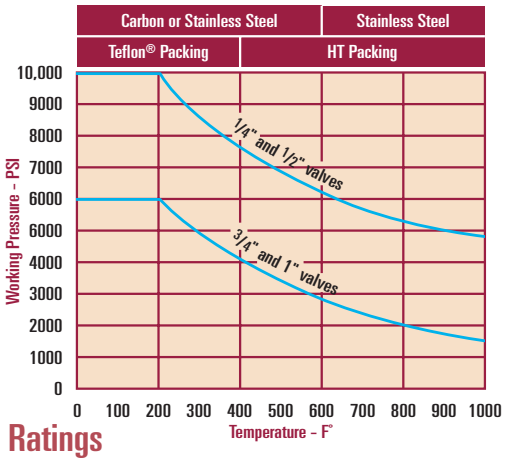


Parts List & Materials

Index	Description	Materials		
		Carbon Steel	316 Stainless	NACE*
1	Body	Carbon Steel-AISI 1215 or 12L14	316 Stainless Steel (or CF8M)	
2	Bonnet	Carbon Steel-AISI 1215 or 12L14	316 Stainless Steel	
3	Stem 1/4" and 1/2"	316 Stainless Steel		
	Stem 3/4" and 1"	303 Stainless Steel	316 Stainless Steel	
4	Packing -Std.	Teflon®		
	Packing -Ht.	Grafoil		
5	Retainer	Carbon Steel-AISI 1215 or 12L14	316 Stainless Steel	
6	Packing Nut	Carbon Steel-AISI 1215 or 12L14	316 Stainless Steel	
7	Handle	Carbon Steel-AISI 1215 or 12L14	316 Stainless Steel	
8	Handle Bolt	Carbon Steel	316 Stainless Steel	
9	Locking Pin	Carbon Steel	316 Stainless Steel	
10	Seat (Soft Seat Only)	Nylon		
11	Bleed Screw (Optional)	316 Stainless Steel		

*NACE valves-Sour Gas Valve Assembly-Valves are manufactured of 316 SS. All parts RC 22 or less to meet NACE MR-01-75 standards. Working pressures same as standard valves.

Hard Seated Needle Valve, Maximum Working Pressure vs. Temperature



Ratings

Soft Seat - 6000 psi @ 200˚F max.
Hard Seat - See chart above.

High Temperature Packing

Add Suffix "HT" (Grafoil) to Assembly Part No.

Method of Calculating Flow Coefficient (C_v)

The Flow Coefficient "Cv" of a valve is the flow rate of water (gallons/minute) through a fully opened valve, with a pressure drop of 1 psi across the valve. To find the flow of liquid through valve from the Cv, use the following formulas:

Liquid Flow

$$Q_L = C_v \sqrt{\frac{\Delta P}{G}}$$

Q_L = flow rate of liquid (gal./min.)
ΔP = differential pressure across the valve (psi)
G = Specific gravity of liquid (for water, G=1)

Gas Flow

$$Q_g = 61 C_v \sqrt{\frac{P_2 \Delta P}{g}}$$

For non-critical flow $\left\{\frac{\Delta P}{P_2} < 1.0\right\}$

Q_g = flow rate of gas (CFH at STP)
P_2 = outlet pressure (psia)
g = Specific gravity of gas (for air, g=1.000)