jihostroj
AERO TECHNOLOGY & HYDRAULICS

AIRFRAME FUEL EQUIPMENT TECHNICAL DESCRIPTION

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1 GENERAL

This document presents a general technical description of Jihostroj airframe fuel equipment. Jihostroj can make design modifications according to customer requirements.

All presented information and drawings herein are for information only, the actual specifications and drawings are available on request.

Jihostroj can make design modifications according to customer requirements.

2 CONTENT

3 GROUND REFUELING MANAGEMENT

3.1 Ground Refueling Valve LUN 7707.xx

3.1.1 Description

The Ground Refueling Valve LUN 7707.xx enables the connection of the ground refueling adapter and central refueling of aircraft tanks. The inlet port of the Valve is protected with a cap attached to the aircraft frame via a chain.
When refueling, the cap is removed and the refueling adapter, connected via a poppet type valve, opens the fuel flow to the tank. When the refueling adapter is removed, the poppet valve closes the fuel line.

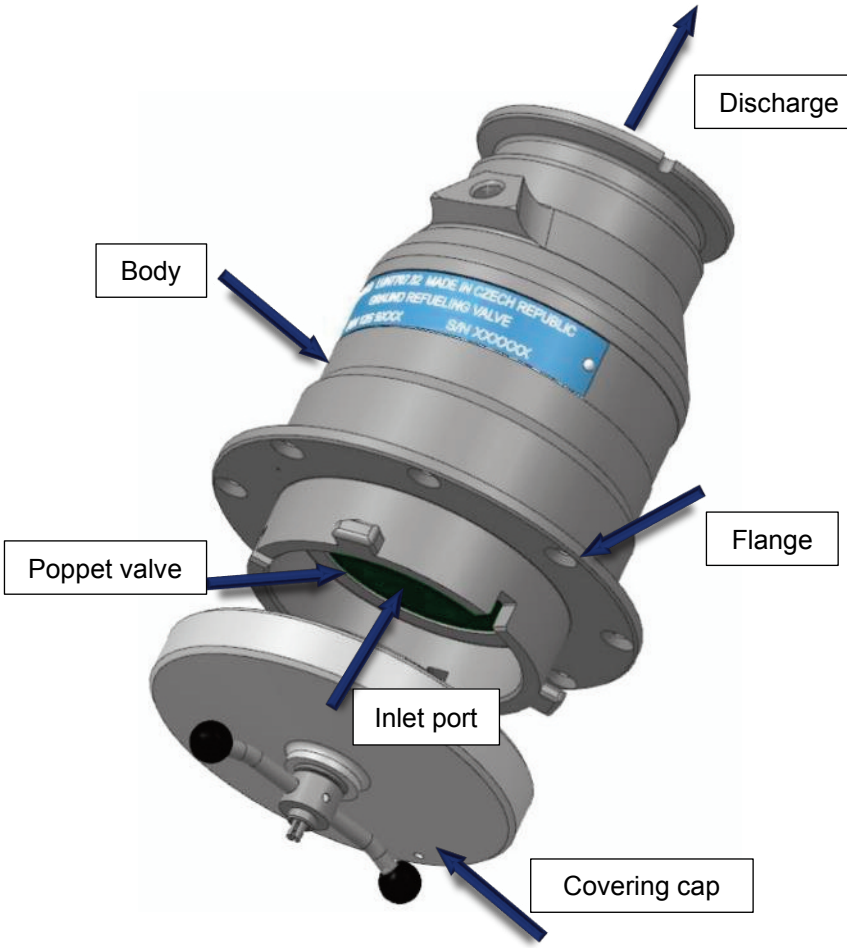


Figure 301 - Ground Refueling Valve LUN 7707 series

3.1.2 Technical parameters

Weight	1.1 kg
Operating temperature	-55 °C to +70 °C
Not operating temperature	-55 °C to +85 °C
Fluid temperature	-55 °C to +60 °C
Fluids	all typical A/C fuels and additives
Altitude	from 0 to 45 000 ft
Internal leakage	absolutely tight
Operating pressure	350 kPa
Proof pressure	500 kPa
Discharge fitting* (Nominal inner diameter)	SAE AS 24563-1-150 (1.3125'' - *33,4 mm* -) SAE AS 24563-2-175 (1.65'' - *42 mm* -) SAE AS 24563-2-225(2.25'' -*57,2 mm* -)

** Three types of discharge fitting are available. The difference is only in discharge fitting dimension.*

3.1.3 Technical life, Maintenance, MTBF

Technical life	unlimited
Maintenance mode	on condition
MTBF	over 200 000 flight hours

Note: Unlimited life means that the product can be operated until the first malfunction without any regular maintenance. It must be defined by aircraft manufacturer whether this unlimited life can be applicable.

3.1.4 Certification base

Ground Refueling Valve LUN 7707 series conform to **RTCA/DO-160G**, categories:

Section	Environmental Conditions	Categories
4	Temperature and Altitude	C2
5	Temperature Variation	B
6	Humidity	B
7	Operational Shocks and Crash Safety	B
8	Vibration	S curve C
9	Explosion Proof	X
10	Waterproofness	W
11	Fluid Susceptibility	F
12	Sand and Dust	D
13	Fungus Resistance	F
14	Salt Spray	S
15	Magnetic Effect	X
16	Power Input	X
17	Voltage Spike	X
18	Audio Frequency Conducted Susceptibility-Power Inputs	X
19	Induced Signal Susceptibility	X
20	Radio Frequency Susceptibility (Radiated and Conducted)	X
21	Emission of Radio Frequency Energy	X
22	Lightning Induced Transient Susceptibility	X
23	Lightning Direct Effects	X

Tests marked X are not performed.

3.1.5 Installation dimensions

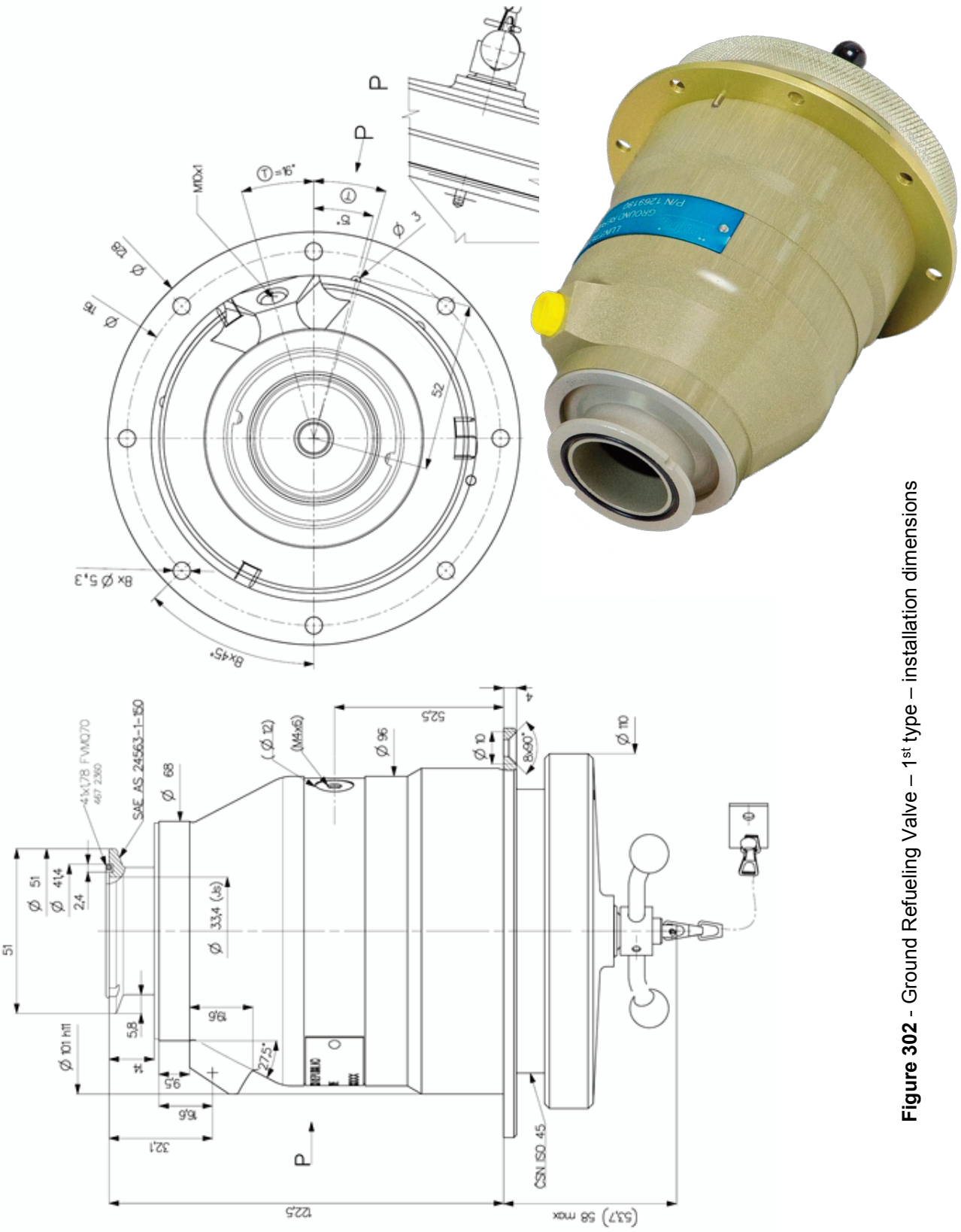


Figure 302 - Ground Refueling Valve – 1st type – installation dimensions

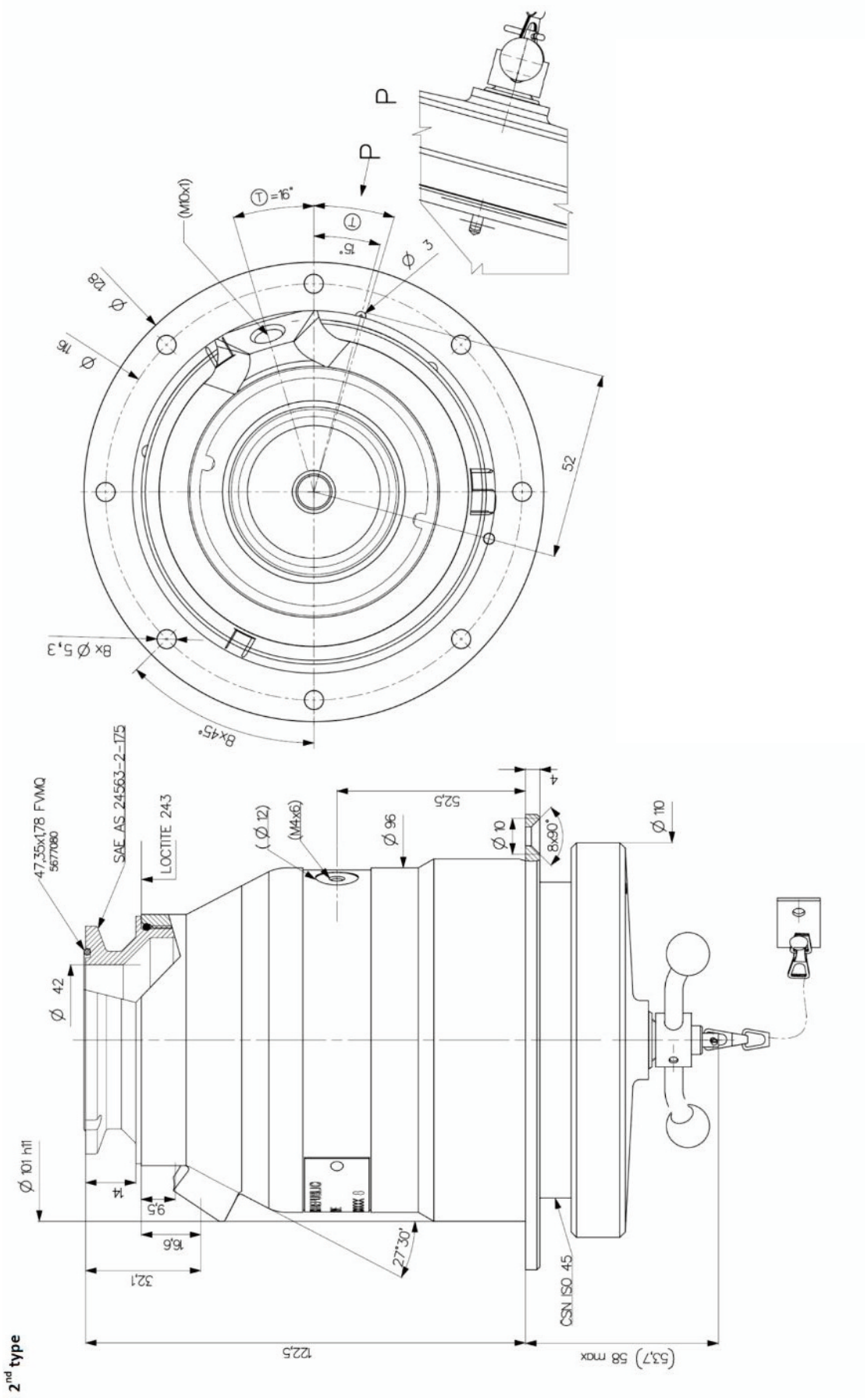


Figure 303 - Ground Refueling Valve – 2nd type – installation dimensions

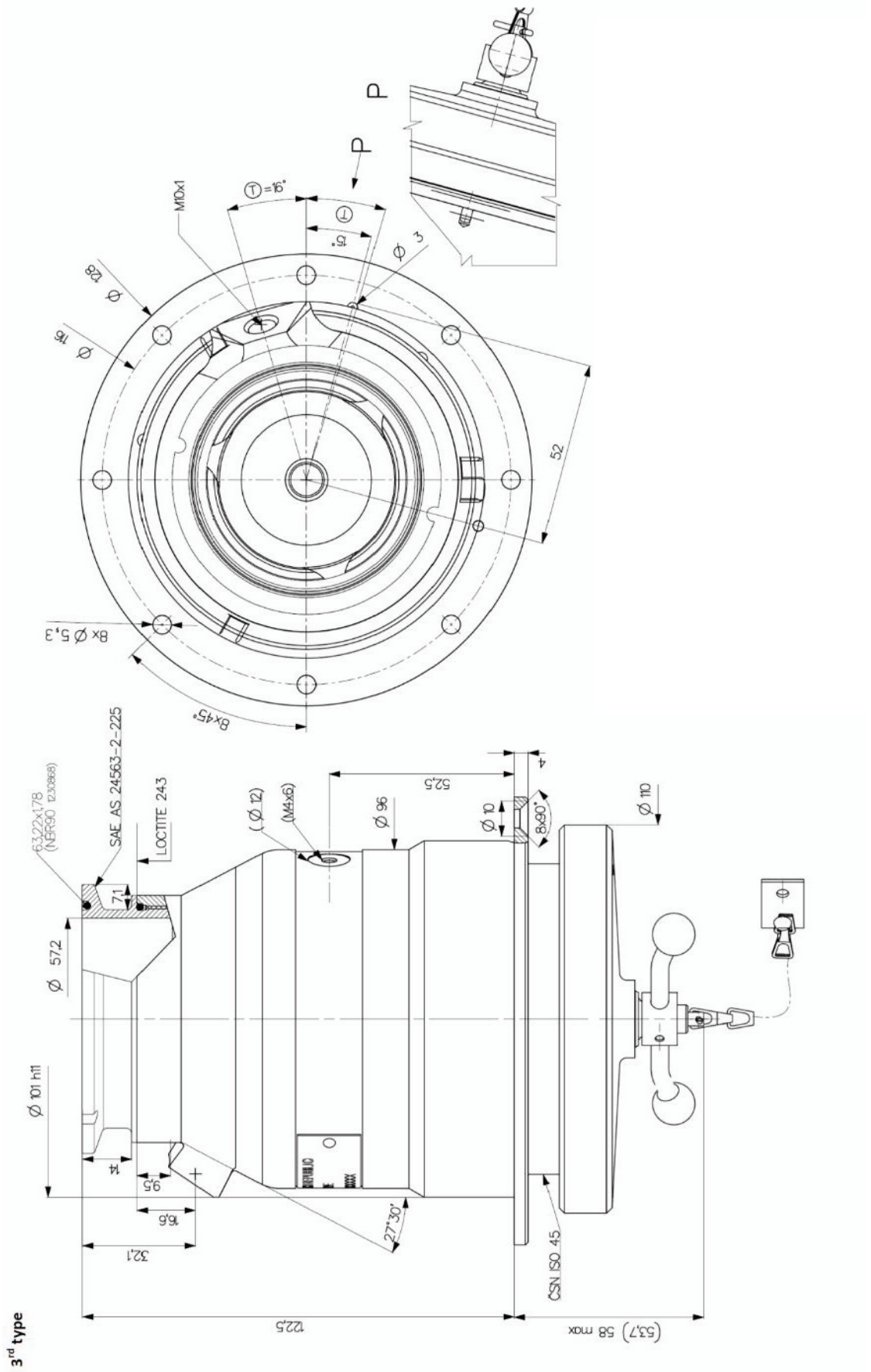


Figure 304 - Ground Refueling Valve – 3rd type – installation dimensions

3.2 Differential Valve LUN 7461.xx

3.2.1 Description

The Differential Valve enables the refueling of fuel tanks. The Valve opens the refueling line if fuel pressure occurs at the inlet port and the solenoid valve is energized. The Valve closes the refueling line if the solenoid is deenergized or after receiving a hydraulic signal from Float Valve LUN 7460.
The Differential Valve includes a safety overpressure Valve which protects the line between the ground refueling valve and the Differential Valve from overpressure in case of fuel volume expansion due to temperature changes.

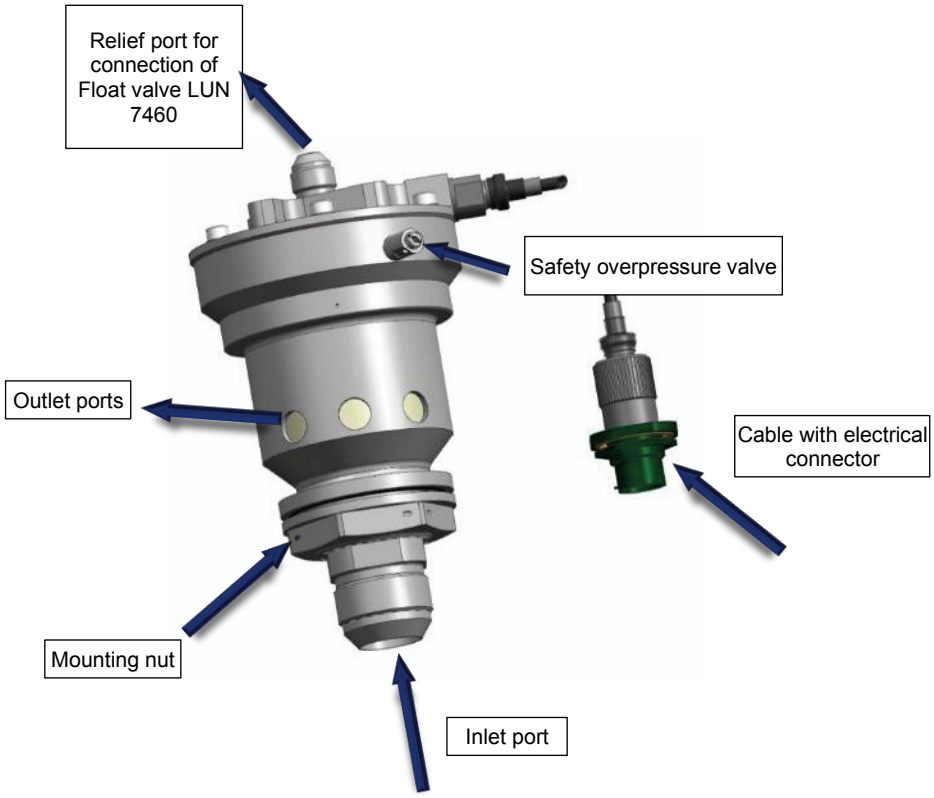


Figure 305 - Differential Valve LUN 7461 series

3.2.2 Technical parameters

Weight	1.1 kg
Operating temperature	-55 °C to +70 °C
Not operating temperature	-55 °C to +85 °C
Fluid temperature	-55 °C to +60 °C
Fluids	all typical A/C fuels and additives
Altitude	from 0 to 45 000 ft
Internal leakage	absolutely tight
Maximal Operating pressure	390 kPa
Cracking pressure of Safety valve	500 kPa

3.2.3 Technical life, Maintenance, MTBF

Technical life	unlimited
Maintenance mode	on condition
MTBF	over 200 000 flight hours

Note: Unlimited life means that the product can be operated until the first malfunction without any regular maintenance. It must be defined by aircraft manufacturer whether this unlimited life can be applicable.

3.2.4 Certification base

Differential Valve LUN 7461 series conform to **RTCA/DO-160G**, categories:

Section	Environmental Conditions	Categories
4	Temperature and Altitude	C2
5	Temperature Variation	B
6	Humidity	B
7	Operational Shocks and Crash Safety	B
8	Vibration	S curve T
9	Explosion Proof	A, environment I
10	Waterproofness	W
11	Fluid Susceptibility	F
12	Sand and Dust	X
13	Fungus Resistance	F
14	Salt Spray	X
15	Magnetic Effect	X
16	Power Input	B
17	Voltage Spike	A
18	Audio Frequency Conducted Susceptibility-Power Inputs	X
19	Induced Signal Susceptibility	X
20	Radio Frequency Susceptibility (Radiated and Conducted)	X
21	Emission of Radio Frequency Energy	X
22	Lightning Induced Transient Susceptibility	X
23	Lightning Direct Effects	X

Tests marked X are not performed.

3.2.5 Installation dimensions

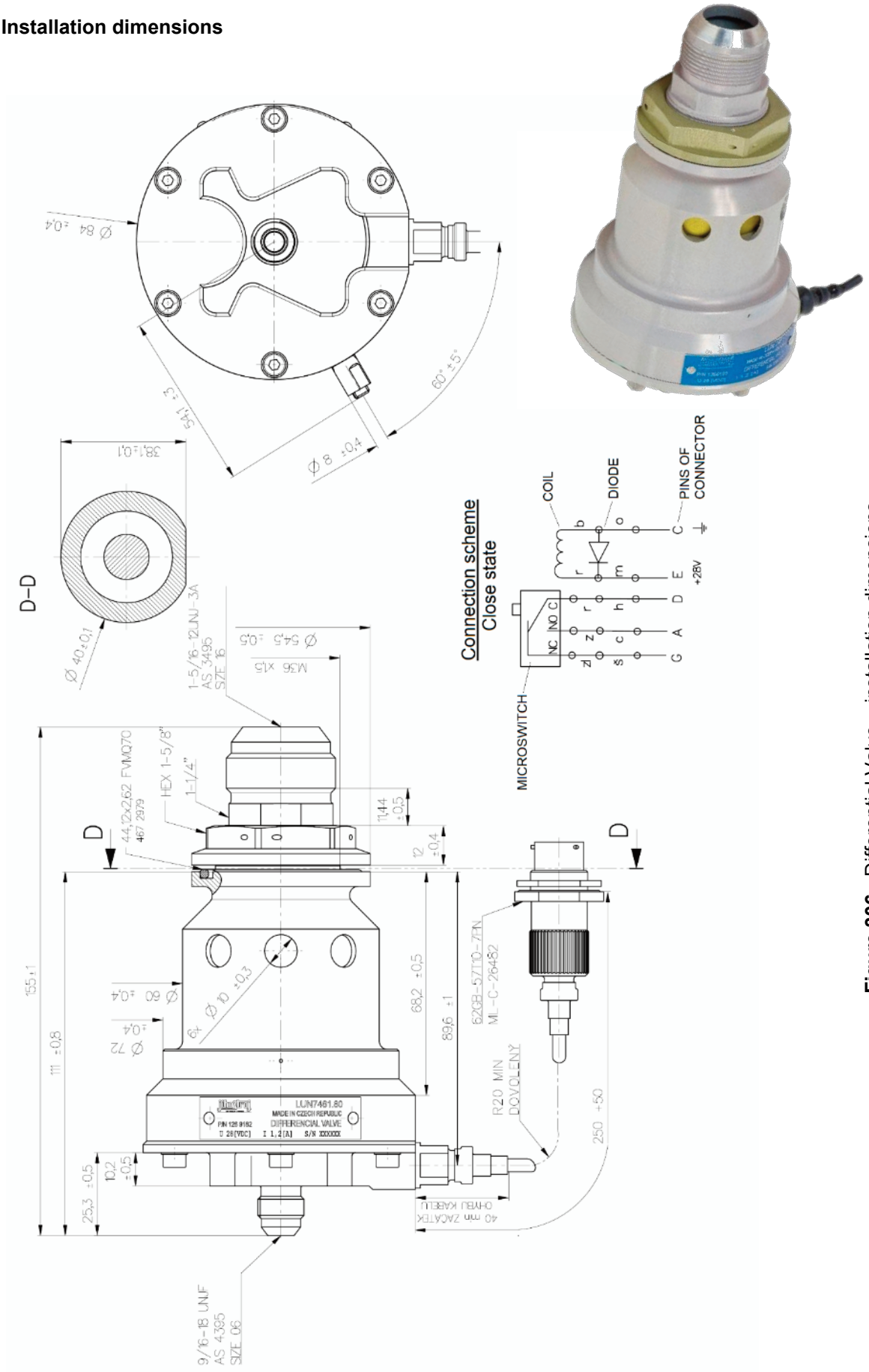


Figure 306 - Differential Valve – installation dimensions

3.3 Float Valve LUN 7460.xx

3.3.1 Description

The Float Valve is designed as a safety valve in case of failure of the solenoid of Differential Valve LUN 7461. If the maximum level of fuel in the tank exceeds its maximum level during refueling, the Float Valve closes the Differential Valve with a hydraulic signal.
The Float Valve consists of a float on a lever with a ball at the end. The ball fits tightly to a seat in a rectangular flange. The Float Valve is mounted in the aircraft tank with 4 screws or rivets.

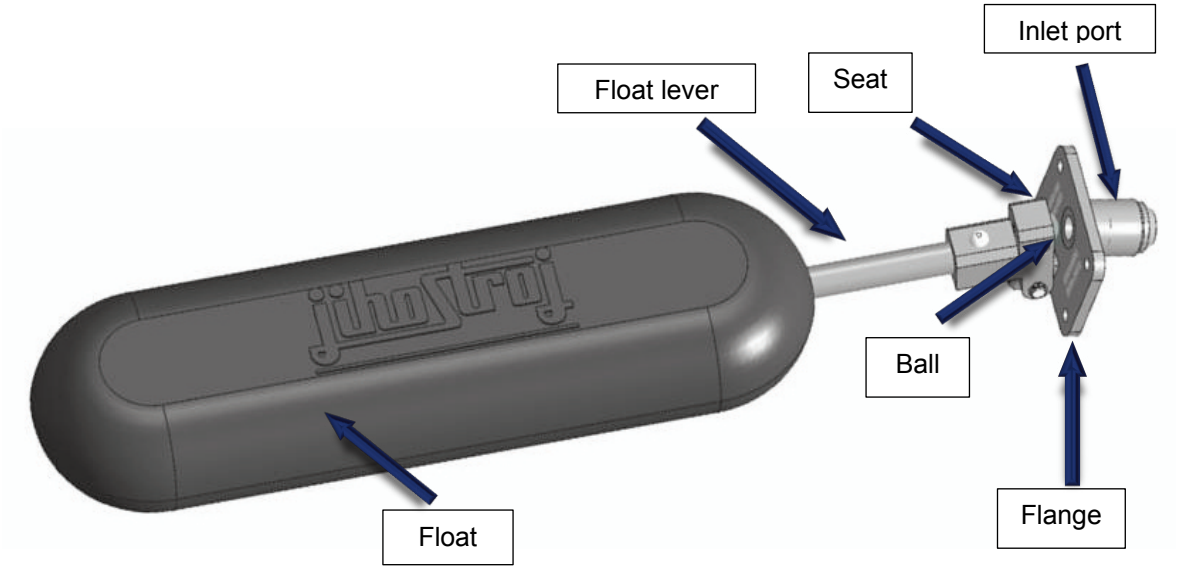


Figure 307 - Float Valve LUN 7465 series

3.3.2 Technical parameters

Weight	0.1 kg
Operating temperature	-55 °C to +70 °C
Not operating temperature	-55 °C to +85 °C
Fluid temperature	-55 °C to +60 °C
Fluids	all typical A/C fuels and additives
Altitude	from 0 to 45 000 ft
Maximum operating pressure	400 kPa
Internal leakage	20 drops per minute max.

3.3.3 Technical life, Maintenance, MTBF

Technical life	unlimited
Maintenance mode	on condition
MTBF	over 200 000 flight hours

Note: Unlimited life means that the product can be operated until the first malfunction without any regular maintenance. It must be defined by aircraft manufacturer whether this unlimited life can be applicable.

3.3.4 Certification base

Float Valve LUN 7460 series conform to **RTCA/DO-160G**, categories:

Section	Environmental Conditions	Categories
4	Temperature and Altitude	C2
5	Temperature Variation	B
6	Humidity	B
7	Operational Shocks and Crash Safety	B
8	Vibration	S curve T
9	Explosion Proof	X
10	Waterproofness	W
11	Fluid Susceptibility	F
12	Sand and Dust	D
13	Fungus Resistance	F
14	Salt Spray	S
15	Magnetic Effect	X
16	Power Input	X
17	Voltage Spike	X
18	Audio Frequency Conducted Susceptibility-Power Inputs	X
19	Induced Signal Susceptibility	X
20	Radio Frequency Susceptibility (Radiated and Conducted)	X
21	Emission of Radio Frequency Energy	X
22	Lightning Induced Transient Susceptibility	X
23	Lightning Direct Effects	X

Tests marked X are not performed.

3.3.5 Installation dimensions

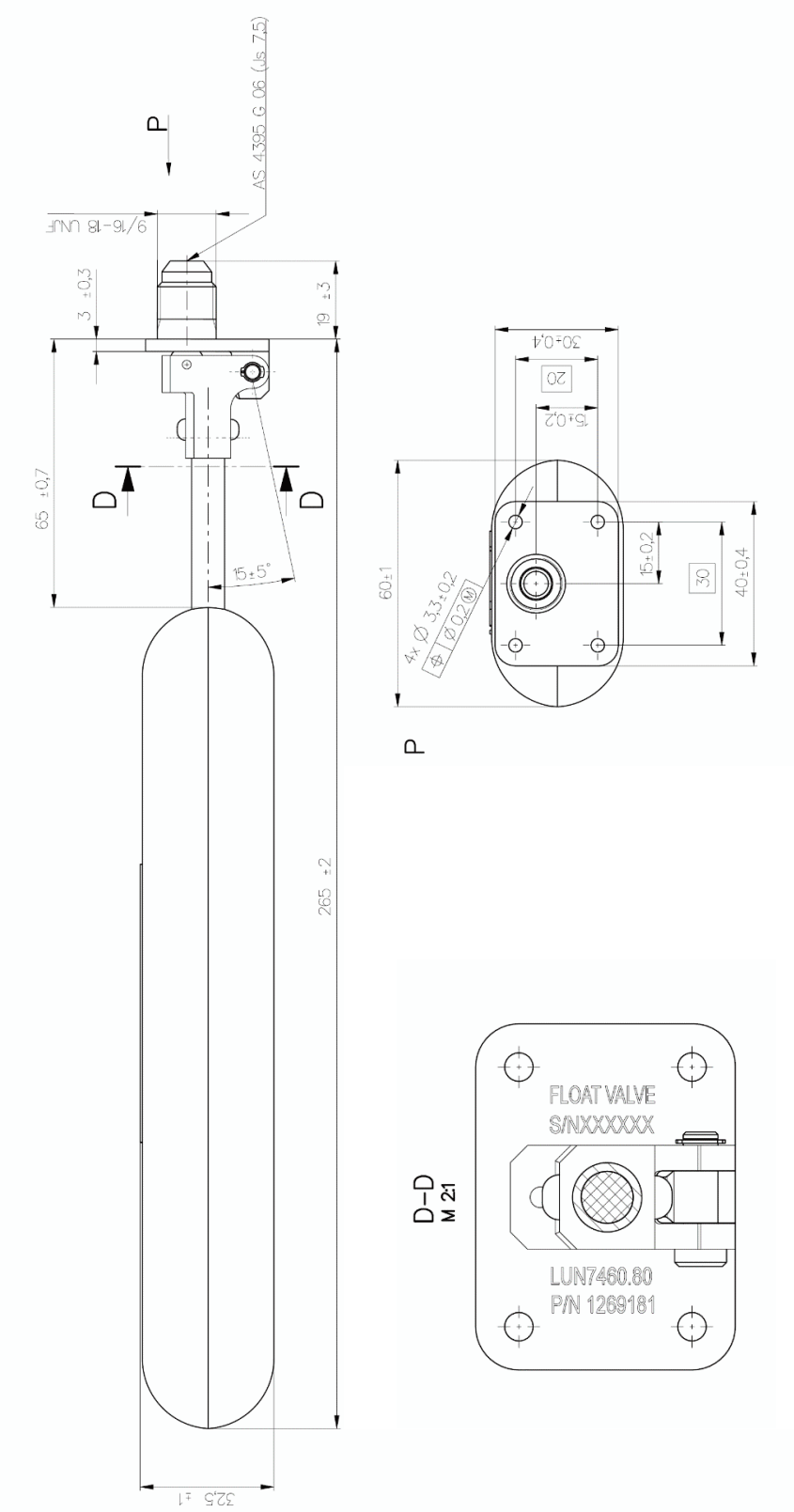


Figure 308 - Float Valve – installation dimensions

3.4 Discharge Valve LUN 7468.xx

3.4.1 Description

The Discharge Valve LUN 7468.xx is designed for the quick discharge of fuel from aircraft tanks on the ground after connection of the ground defueling adapter.
Connecting the ground defueling adapter causes a change in position of the poppet valve, which opens the Valve. After disconnecting the ground defueling adapter, the spring pushes the poppet valve back to the seat and closes the Valve. The protective cap assures the second stage of sealing.

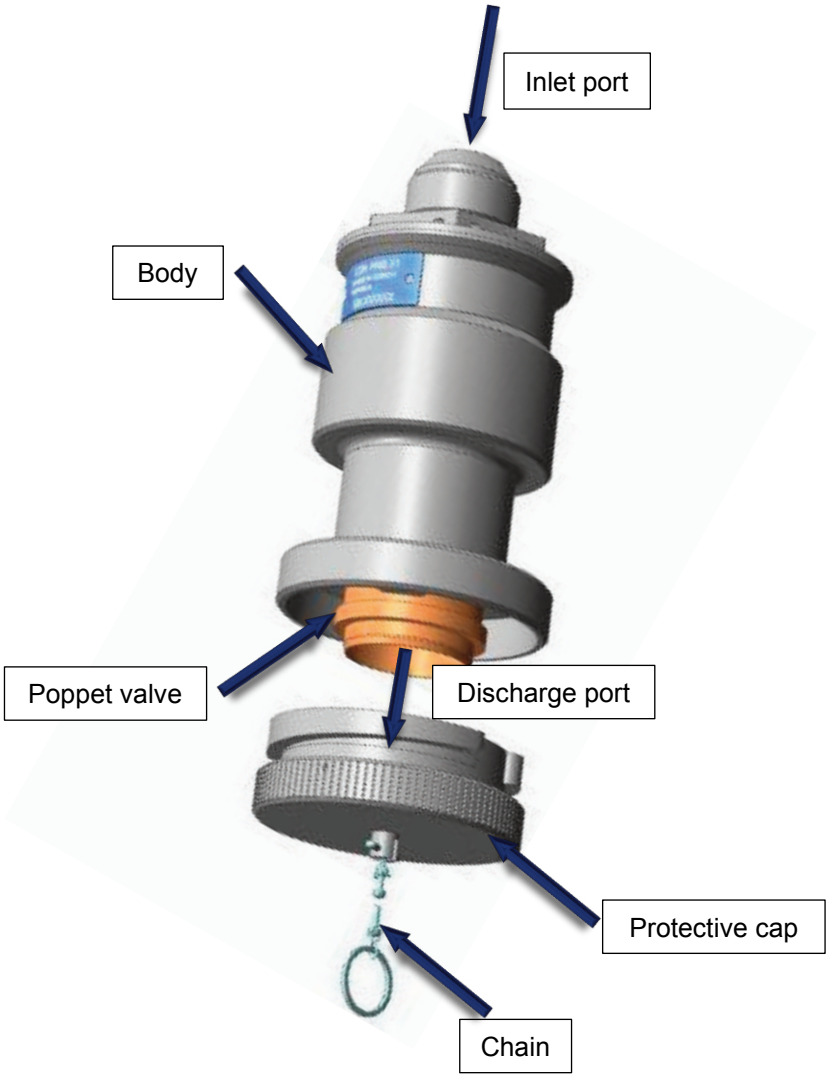


Figure 309 - Discharge valve LUN 7468 series

3.4.2 Technical parameters

Weight:	0.31 kg
Operating temperature:	-55 °C to +70 °C
Not operating temperature	-55 °C to +85 °C
Fluid temperature:	-55 °C to +60 °C
Fluids:	All typical A/C fuels and additives
Altitude	from 0 to 45 000 ft
Internal leakage	Absolutely tight
Operating pressure	300 kPa
Proof pressure	500 kPa
Connection flange	30 GOST 13 468-8

3.4.3 Technical life, Maintenance, MTBF

Technical life:	Unlimited
Maintenance mode:	On condition
MTBF:	Over 200 000 flight hours

Note: Unlimited life means that the product can be operated until the first malfunction without any regular maintenance. It must be defined by aircraft manufacturer whether this unlimited life can be applicable.

3.4.4 Certification base

The Discharge valve LUN 7468 series conforms to **RTCA/DO-160G**, categories:

Section	Environmental Conditions	Categories
4	Temperature and Altitude	C2
5	Temperature Variation	B
6	Humidity	B
7	Operational Shocks and Crash Safety	B
8	Vibration	S curve T
9	Explosion Proof	X
10	Waterproofness	W
11	Fluid Susceptibility	F
12	Sand and Dust	D
13	Fungus Resistance	F
14	Salt Spray	S
15	Magnetic Effect	X
16	Power Input	X
17	Voltage Spike	X
18	Audio Frequency Conducted Susceptibility-Power Inputs	X
19	Induced Signal Susceptibility	X
20	Radio Frequency Susceptibility (Radiated and Conducted)	X
21	Emission of Radio Frequency Energy	X
22	Lightning Induced Transient Susceptibility	X
23	Lightning Direct Effects	X

Tests marked X are not performed.

3.4.5 Installation dimensions

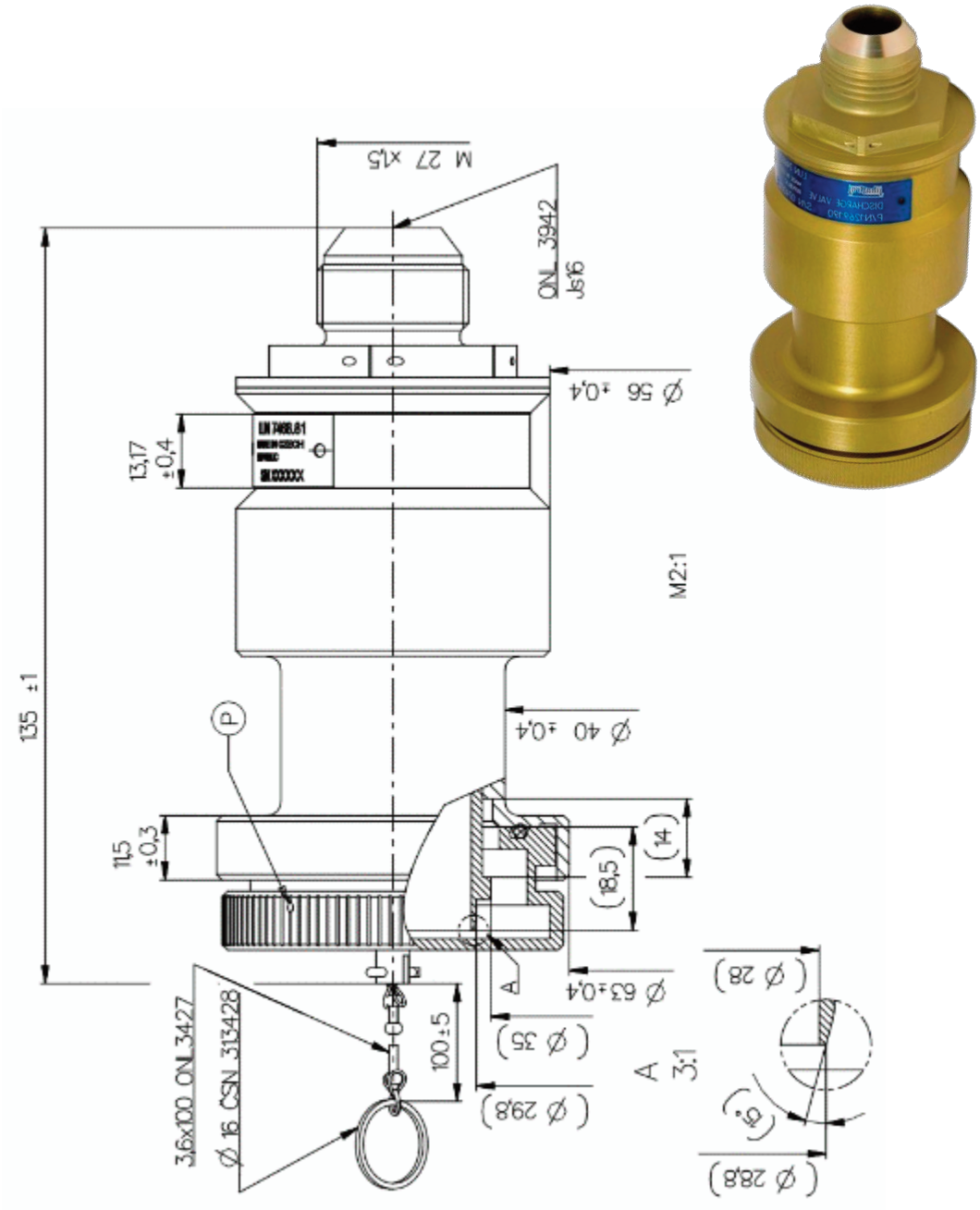


Figure 310 - Discharge valve LUN 7468 series

4 PROTECTING DEVICES

4.1 Float Vent Valve LUN 7465.xx

4.1.1 Description

The Float Vent Valve prevents fuel leakage to the vent line of the fuel tank. When the fuel level reaches the inlet port of the vent line, the Float Vent Valve closes this port so the fuel cannot flow to the vent line and thus leak from the tank. After the fuel level decreases, the Float Vent Valve opens the vent line and connects the tank with the atmosphere again.
The Float Vent Valve consists of a float on a lever with a movable poppet at its end. The movable poppet fits tightly into a circular seat. The Float Vent Valve is mounted into the aircraft tank by a mounting nut. The nominal diameter of the inlet port is ø 12 mm.

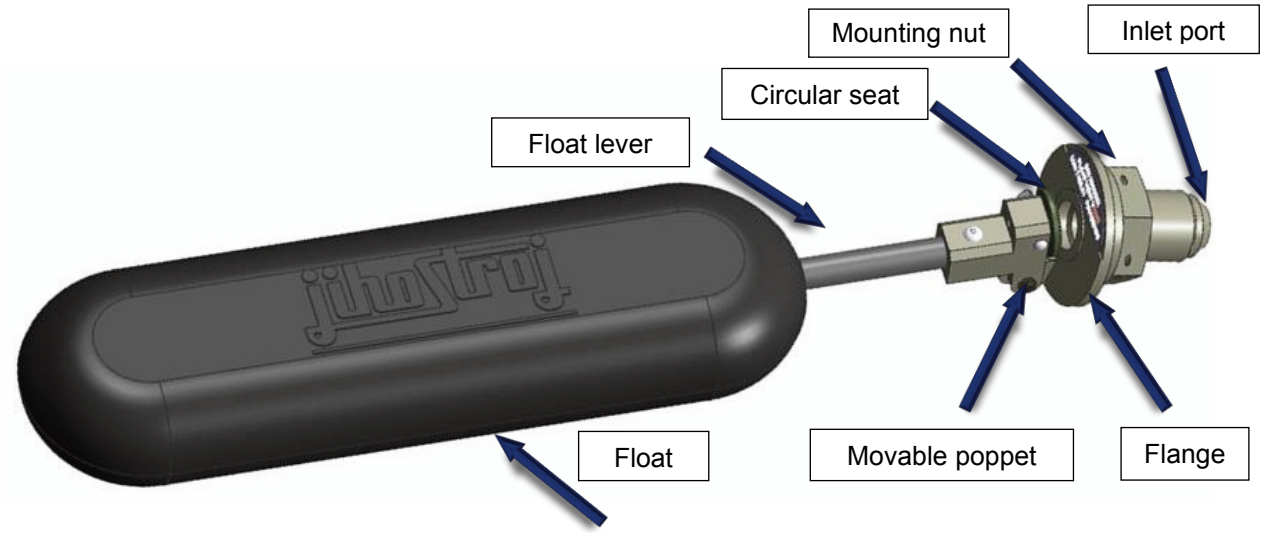


Figure 411 - Float Vent LUN 7465 series

4.1.2 Technical parameters

Weight	0.125 kg
Operating temperature	-55 °C to +70 °C
Not operating temperature	-55 °C to +85 °C
Fluid temperature	-55 °C to +60 °C
Fluids	all typical A/C fuels and additives
Altitude	from 0 to 45 000 ft
Internal leakage	10 drops per minute max.

4.1.3 Technical life, Maintenance, MTBF

Technical life	unlimited
Maintenance mode	on condition
MTBF	over 200 000 flight hours

Note: Unlimited life means that the product can be operated until the first malfunction without any regular maintenance. It must be defined by aircraft manufacturer whether this unlimited life can be applicable.

4.1.4 Certification base

Float Vent Valve LUN 7465 series conform to **RTCA/DO-160G**, categories:

Section	Environmental Conditions	Categories
4	Temperature and Altitude	C2
5	Temperature Variation	B
6	Humidity	B
7	Operational Shocks and Crash Safety	B
8	Vibration	S curve T
9	Explosion Proof	X
10	Waterproofness	W
11	Fluid Susceptibility	F
12	Sand and Dust	D
13	Fungus Resistance	F
14	Salt Spray	S
15	Magnetic Effect	X
16	Power Input	X
17	Voltage Spike	X
18	Audio Frequency Conducted Susceptibility-Power Inputs	X
19	Induced Signal Susceptibility	X
20	Radio Frequency Susceptibility (Radiated and Conducted)	X
21	Emission of Radio Frequency Energy	X
22	Lightning Induced Transient Susceptibility	X
23	Lightning Direct Effects	X

Tests marked X are not performed.

4.1.5 Installation dimensions

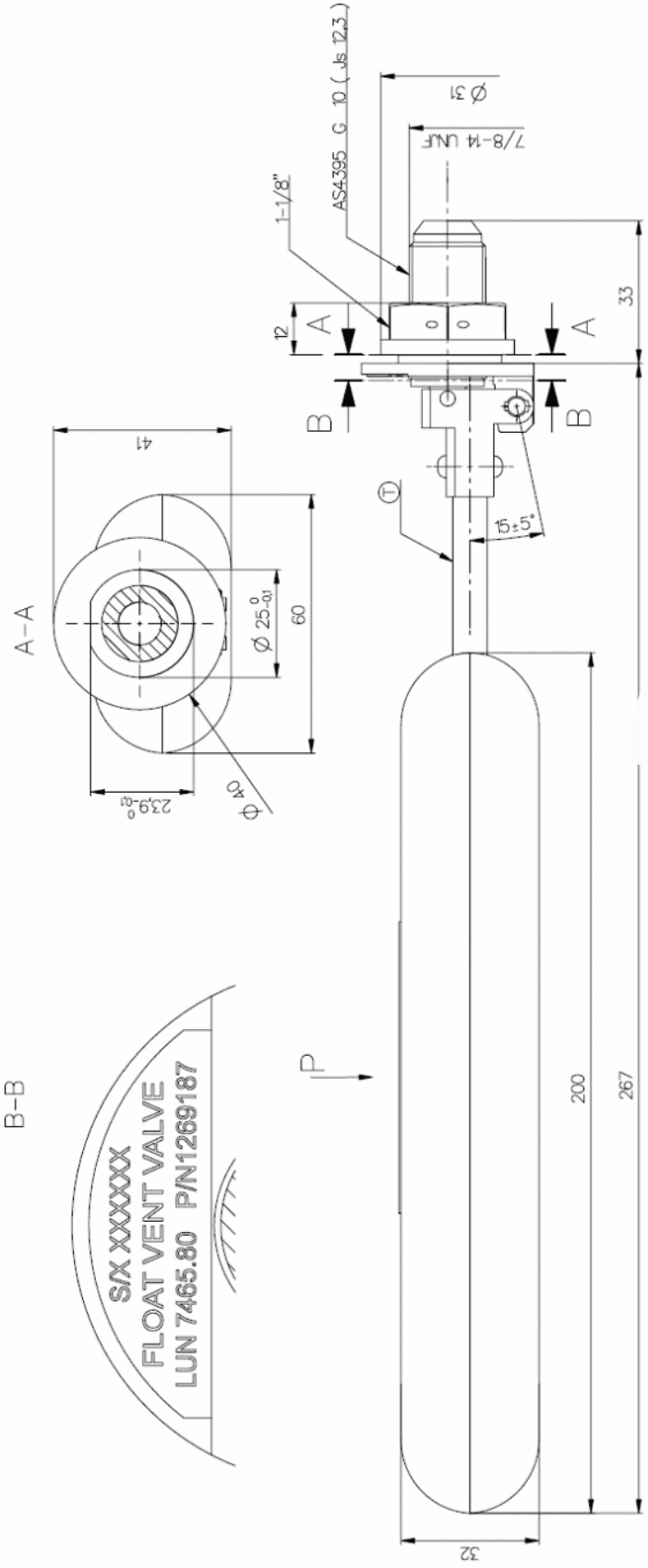


Figure 412 - Float Vent Valve – installation dimensions

4.2 Overpressure Safety Valve LUN 7466.xx

4.2.1 Description

The Overpressure Safety Valve protects the tank against overpressure after failure of the tank vent system and prevents fuel leakage from the tank.
The Safety Valve consists of a body with an inlet and outlet port. Inside the Valve is a poppet which fits tightly to seat inside the Valve body (metal to metal sealing). When the pressure in the tank rises above the preset level, the poppet moves from the seat and connects the tank with the ambient atmosphere.

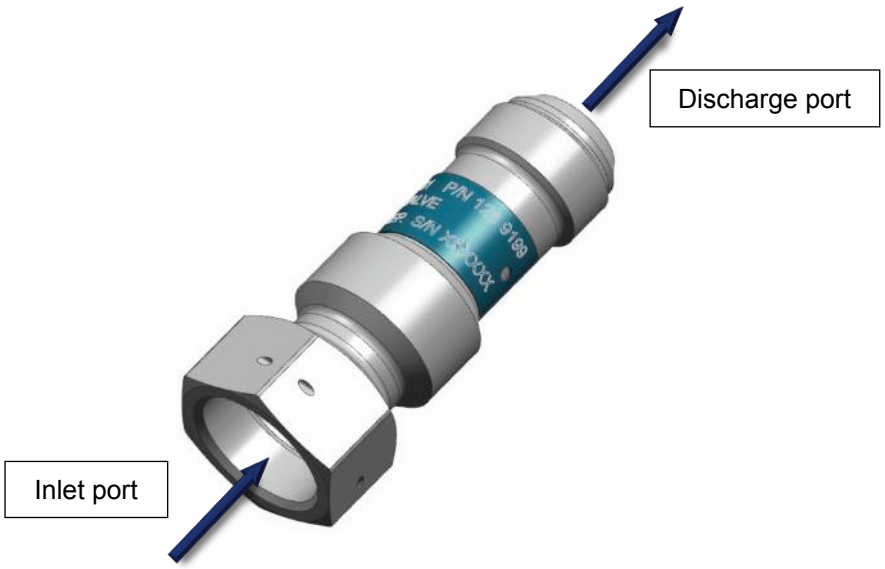


Figure 413 - Safety Valve LUN 7466 series

4.2.2 Technical parameters

Weight	0.06 kg
Operating temperature	-55 °C to +70 °C
Not operating temperature	-55 °C to +85 °C
Fluid temperature	-55 °C to +60 °C
Fluids	all typical A/C fuels and additives
Altitude	from 0 to 45 000 ft
Opening pressure*	13,5 ±1,5 kPa
Internal leakage	10 drops per minute max.

* Note: The value of opening pressure is affected by manufacturing tolerances, this value can be adjusted according to customer specification.

4.2.3 Technical life, Maintenance, MTBF

Technical life	unlimited
Maintenance mode	on condition
MTBF	over 200 000 flight hours

Note: Unlimited life means that the product can be operated until the first malfunction without any regular maintenance. It must be defined by aircraft manufacturer whether this unlimited life can be applicable.

4.2.4 Certification base

Overpressure Safety Valve LUN 7466 series conform to **RTCA/DO-160G**, categories:

Section	Environmental Conditions	Categories
4	Temperature and Altitude	C2
5	Temperature Variation	B
6	Humidity	B
7	Operational Shocks and Crash Safety	B
8	Vibration	S curve T
9	Explosion Proof	X
10	Waterproofness	W
11	Fluid Susceptibility	F
12	Sand and Dust	D
13	Fungus Resistance	F
14	Salt Spray	S
15	Magnetic Effect	X
16	Power Input	X
17	Voltage Spike	X
18	Audio Frequency Conducted Susceptibility-Power Inputs	X
19	Induced Signal Susceptibility	X
20	Radio Frequency Susceptibility (Radiated and Conducted)	X
21	Emission of Radio Frequency Energy	X
22	Lightning Induced Transient Susceptibility	X
23	Lightning Direct Effects	X

Tests marked X are not performed.

4.2.5 Installation dimensions

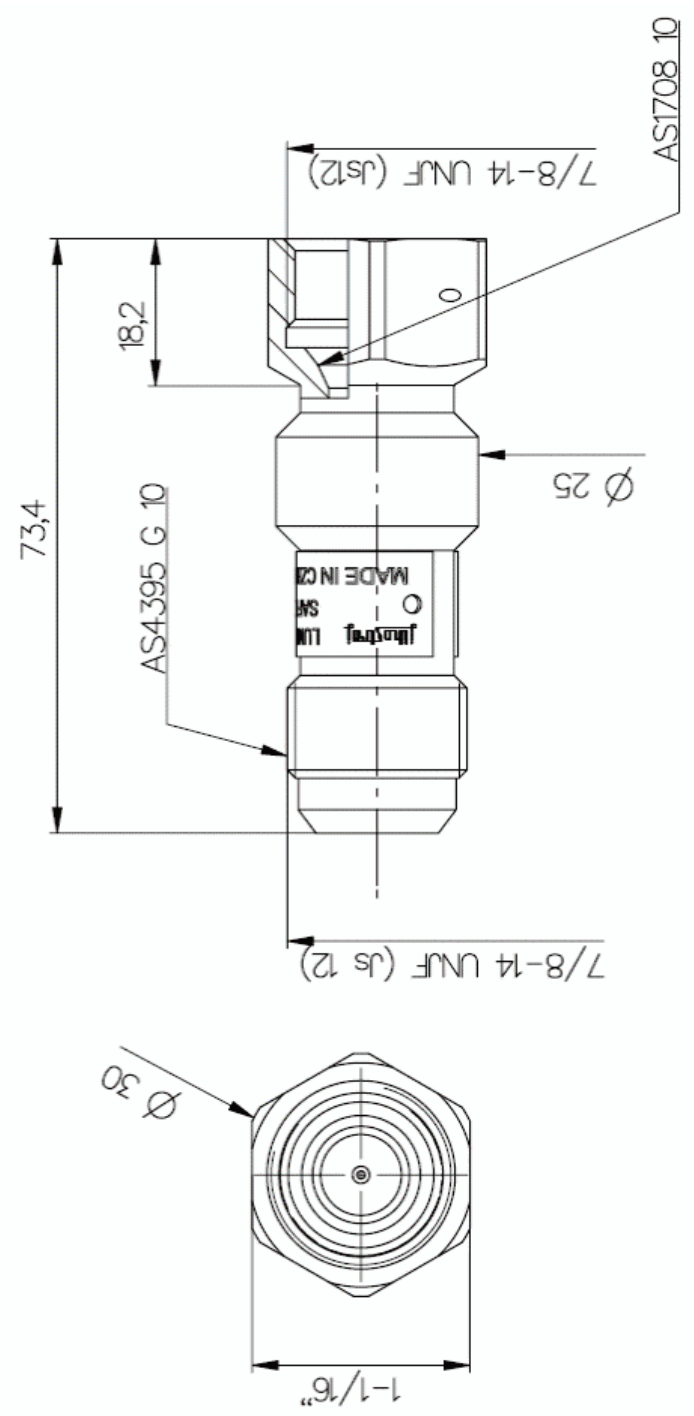


Figure 414 - Overpressure Safety Valve – installation dimensions

4.3 Vacuum Valve LUN 7467.xx

4.3.1 Description

The Vacuum Valve equalizes the lower pressure in the tank with the higher pressure outside the tank (atmosphere) in the event of vent system failure and prevents the leakage of fuel from the tank.
The Vacuum Valve consists of a body with an inlet and outlet port. Inside the body is the poppet which fits tightly to seat inside the Valve body. When the pressure in the tank is lower than atmosphere pressure, the poppet moves from the seat and connects the tank with the atmosphere.
At the inlet port is installed a metallic screen which prevents foreign objects from entering into the Valve from the ambient environment.

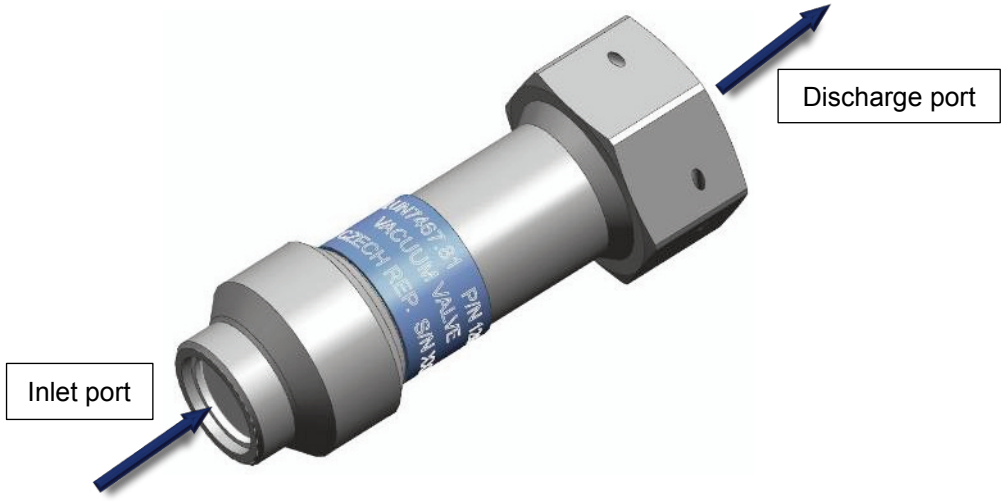


Figure 415 - Vacuum Valve LUN 7467 series

4.3.2 Technical parameters

Weight	0.05 kg
Operating temperature	-55 °C to +70 °C
Not operating temperature	-55 °C to +85 °C
Fluid temperature	-55 °C to +60 °C
Fluids	all typical A/C fuels and additives
Altitude	from 0 to 45 000 ft
Opening pressure	from 6 to 8 kPa
Internal leakage	10 drops per minute

4.3.3 Technical life, Maintenance, MTBF

Technical life	unlimited
Maintenance mode	on condition
MTBF	over 30 000 hours

Note: Unlimited life means that the product can be operated until the first malfunction without any regular maintenance. It must be defined by aircraft manufacturer whether this unlimited life can be applicable.

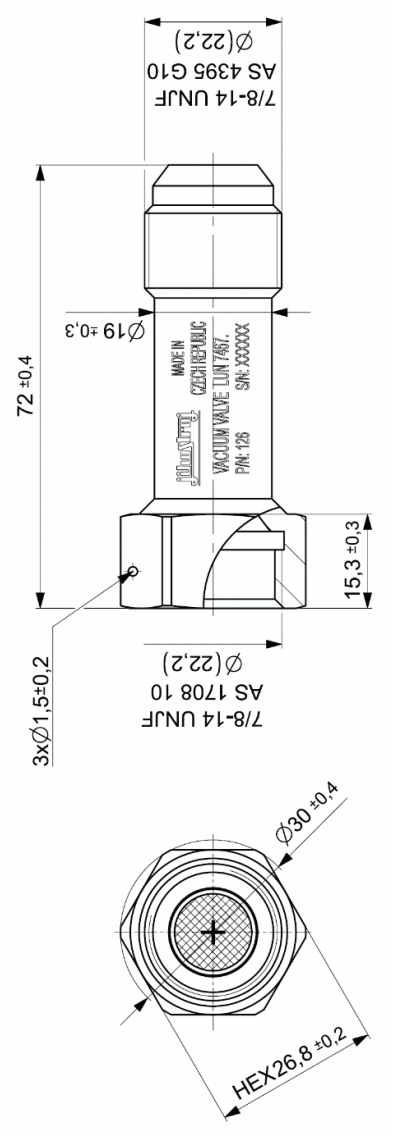
4.3.4 Certification base

Vacuum Valve LUN 7467 series conform to **RTCA/DO-160G**, categories:

Section	Environmental Conditions	Categories
4	Temperature and Altitude	C2
5	Temperature Variation	B
6	Humidity	B
7	Operational Shocks and Crash Safety	B
8	Vibration	S curve T
9	Explosion Proof	X
10	Waterproofness	W
11	Fluid Susceptibility	F
12	Sand and Dust	D
13	Fungus Resistance	F
14	Salt Spray	S
15	Magnetic Effect	X
16	Power Input	X
17	Voltage Spike	X
18	Audio Frequency Conducted Susceptibility-Power Inputs	X
19	Induced Signal Susceptibility	X
20	Radio Frequency Susceptibility (Radiated and Conducted)	X
21	Emission of Radio Frequency Energy	X
22	Lightning Induced Transient Susceptibility	X
23	Lightning Direct Effects	X

Tests marked X are not performed.

4.3.5 Installation dimensions



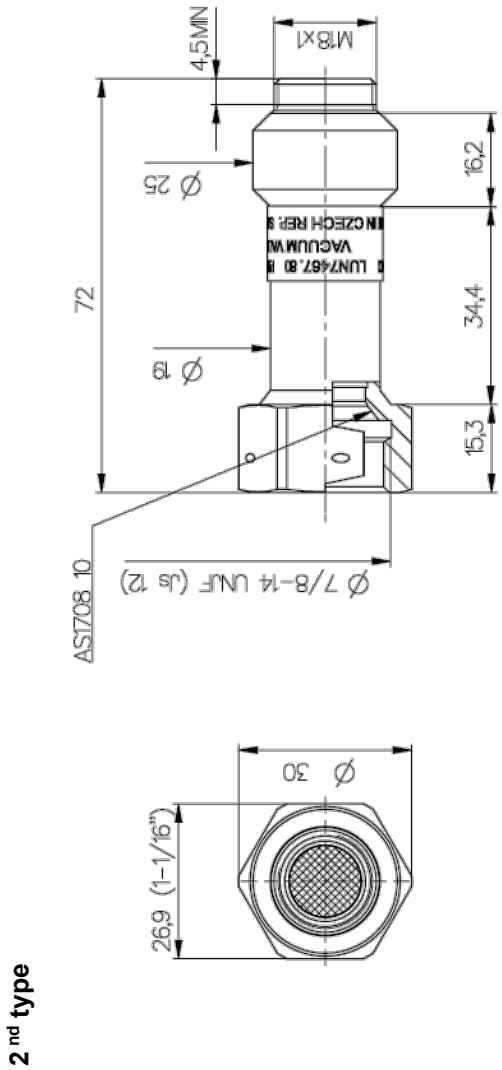


Figure 416 - Vacuum Valve – installation dimensions

4.4 Drain Valve LUN 7340.xx

4.4.1 Description

The Drain Valve enables sediments and water to drain from the lowest part of the fuel tank.
The Valve composes of a main body with a poppet inside. The poppet is pushed to the seat by two springs. The poppet seal is secured with two O-rings and metal-to-metal contact between body and poppet.

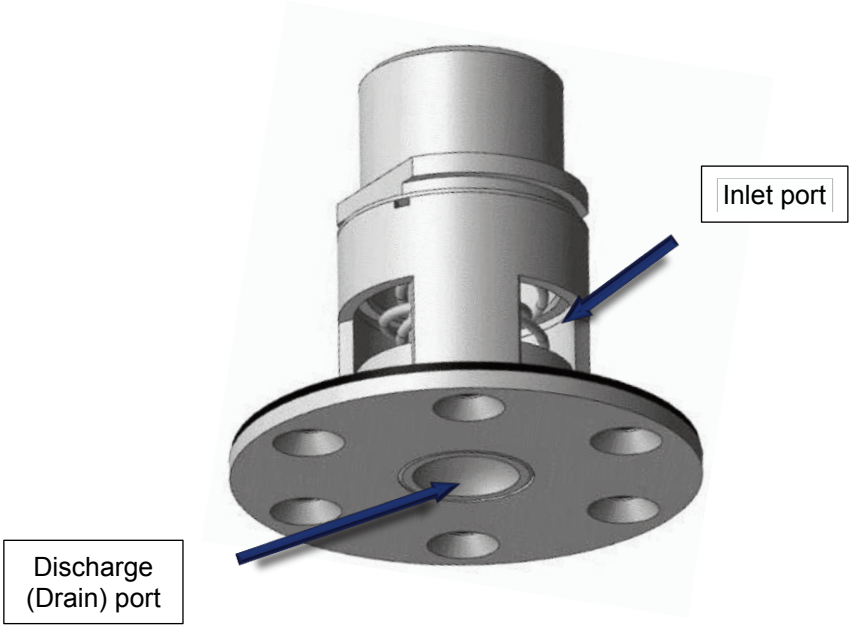


Figure 417 - Drain Valve LUN 7340 series

4.4.2 Technical parameters

Weight	0.09 kg
Operating temperature	-55 °C to +70 °C
Not operating temperature	-55 °C to +85 °C
Fluid temperature	-55 °C to +60 °C
Fluids	all typical A/C fuels and additives
Altitude	from 0 to 45 000 ft
Discharge port nominal inner diameter	16 mm
Operating force	50 ±20 N
Maximal Operating pressure	30 kPa
Internal leakage	absolutely tight
External leakage	absolutely tight

4.4.3 Technical life, Maintenance, MTBF

Technical life	unlimited
Maintenance mode	on condition
MTBF	over 200 000 flight hours

Note: Unlimited life means that the product can be operated until the first malfunction without any regular maintenance. It must be defined by aircraft manufacturer whether this unlimited life can be applicable.

4.4.4 Certification base

Drain Valve LUN 7340 series conforms to **RTCA/DO-160G**, categories:

Section	Environmental Conditions	Categories
4	Temperature and Altitude	C2
5	Temperature Variation	B
6	Humidity	C
7	Operational Shocks and Crash Safety	B
8	Vibration	S curve T
9	Explosion Proof	X
10	Waterproofness	W
11	Fluid Susceptibility	F
12	Sand and Dust	S
13	Fungus Resistance	F
14	Salt Spray	S
15	Magnetic Effect	X
16	Power Input	X
17	Voltage Spike	X
18	Audio Frequency Conducted Susceptibility-Power Inputs	X
19	Induced Signal Susceptibility	X
20	Radio Frequency Susceptibility (Radiated and Conducted)	X
21	Emission of Radio Frequency Energy	X
22	Lightning Induced Transient Susceptibility	X
23	Lightning Direct Effects	1A1A

Tests marked X are not performed.

4.4.5 Installation dimensions

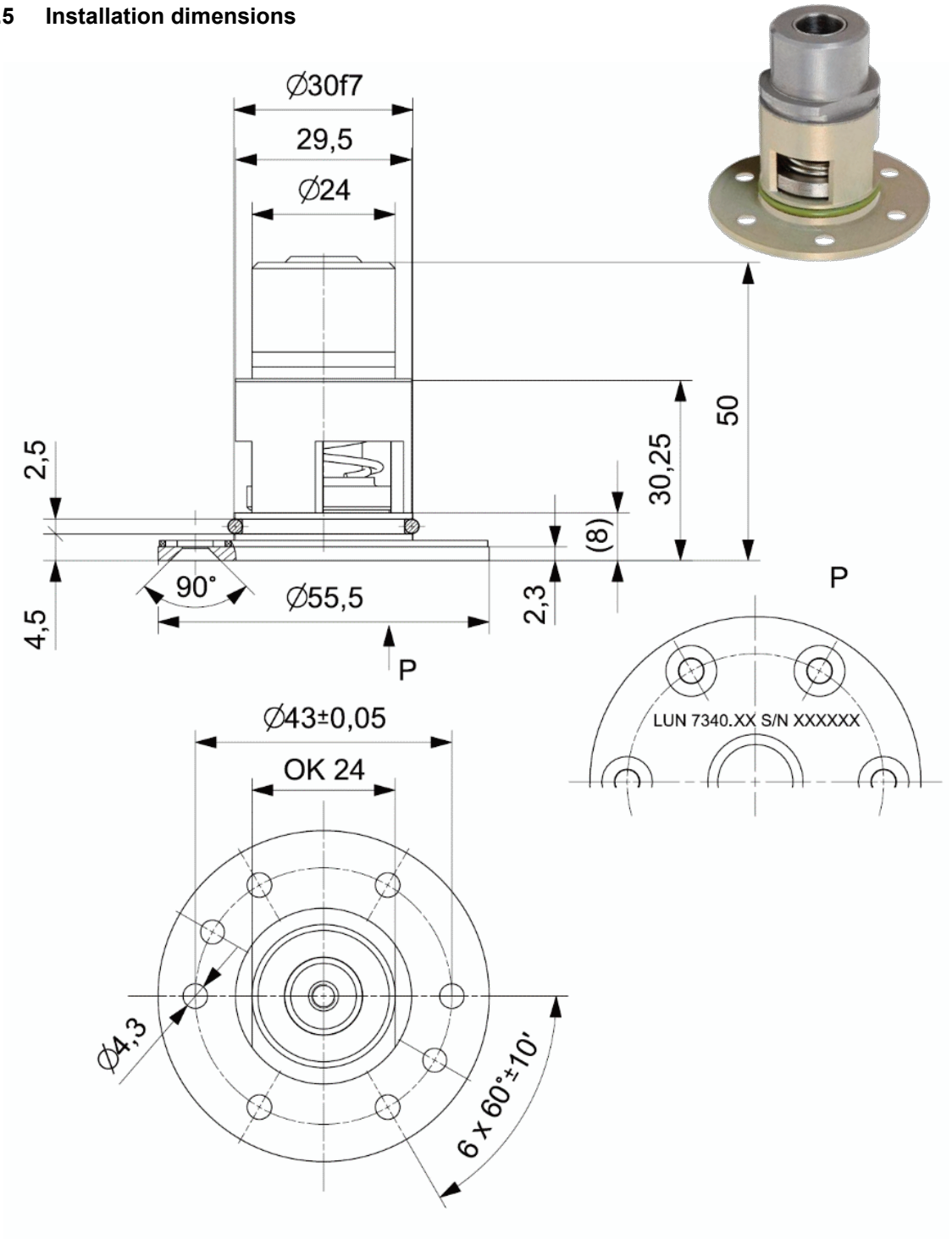


Figure 418 - Drain Valve – installation dimensions

5 FUEL TRANSFER

5.1 Two-Way Valve LUN 7349.xx

5.1.1 Description

The Two-Way Valve LUN 7349 opens or closes the fuel line.
The Valve consists of the main body, solenoid, differential poppet, signalization of poppet position, connector, and fitting ports.
The Valve opens when energized. The position of the Valve (OPEN or CLOSED) is indicated in the cockpit. When the Valve is OPEN, the indicator (light) is ON, when the Valve is CLOSED, the indicator is OFF. The Valve closes when deenergized.

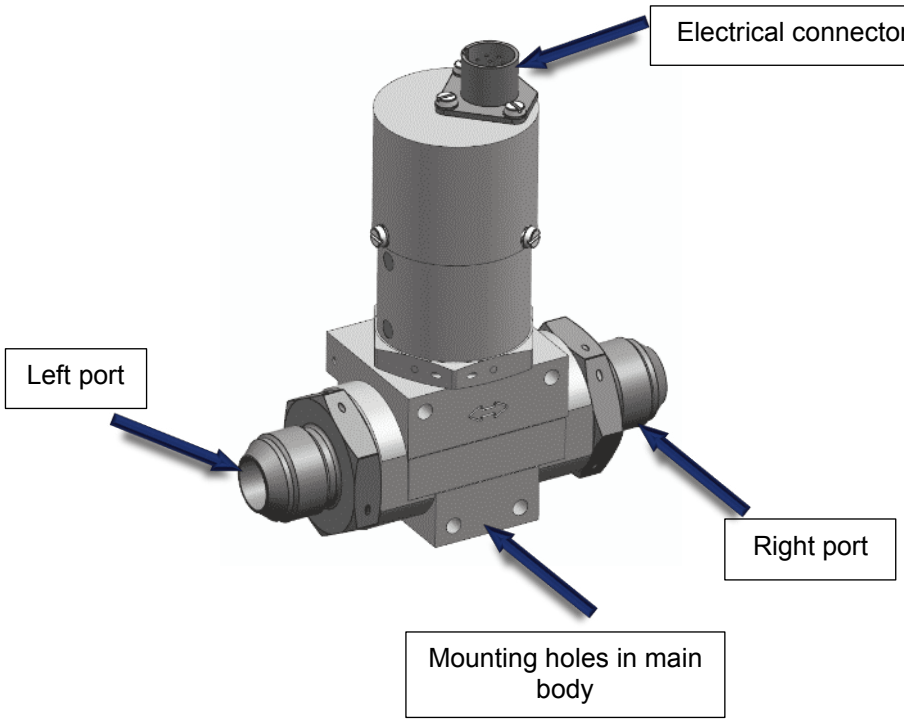


Figure 519 - Two-Way Valve LUN 7349 series

5.1.2 Technical parameters

Weight	0.65 kg
Operating temperature	-55 °C to +70 °C
Not operating temperature	-55 °C to +85 °C
Fluid temperature	-55 °C to +60 °C
Fluids	all typical A/C fuels and additives
Altitude	from 0 to 45 000 ft
Operating pressure	180 kPa
Rated flow	600 l/hr
Proof pressure	500 kPa
Pressure drop (JET A-1, 20 °C)	3 kPa max at flow rate 600 l/hr
Internal leakage	20 drops per minute max.
External leakage	absolutely tight
Nominal voltage	28 Vdc
Current consumption	0.8 A
Operating voltage	22 – 30.2 Vdc
Limiting voltage	18 – 32.2 Vdc

5.1.3 Technical life, Maintenance, MTBF

Technical life	unlimited
Maintenance mode	on condition
MTBF	over 30 000 flight hours

Note: Unlimited life means that the product can be operated until the first malfunction without any regular maintenance. It must be defined by aircraft manufacturer whether this unlimited life can be applicable.

5.1.4 Certification base

Two-Way Valve LUN 7349 series conform to **RTCA/DO-160G**, categories:

Section	Environmental Conditions	Categories
4	Temperature and Altitude	C2
5	Temperature Variation	B
6	Humidity	B
7	Operational Shocks and Crash Safety	B
8	Vibration	S curve T
9	Explosion Proof	A environment I
10	Waterproofness	W
11	Fluid Susceptibility	F
12	Sand and Dust	D
13	Fungus Resistance	F
14	Salt Spray	S
15	Magnetic Effect	B
16	Power Input	B
17	Voltage Spike	A
18	Audio Frequency Conducted Susceptibility-Power Inputs	X
19	Induced Signal Susceptibility	X
20	Radio Frequency Susceptibility (Radiated and Conducted)	X
21	Emission of Radio Frequency Energy	B
22	Lightning Induced Transient Susceptibility	X
23	Lightning Direct Effects	X

Tests marked X are not performed.

5.1.5 Installation dimensions

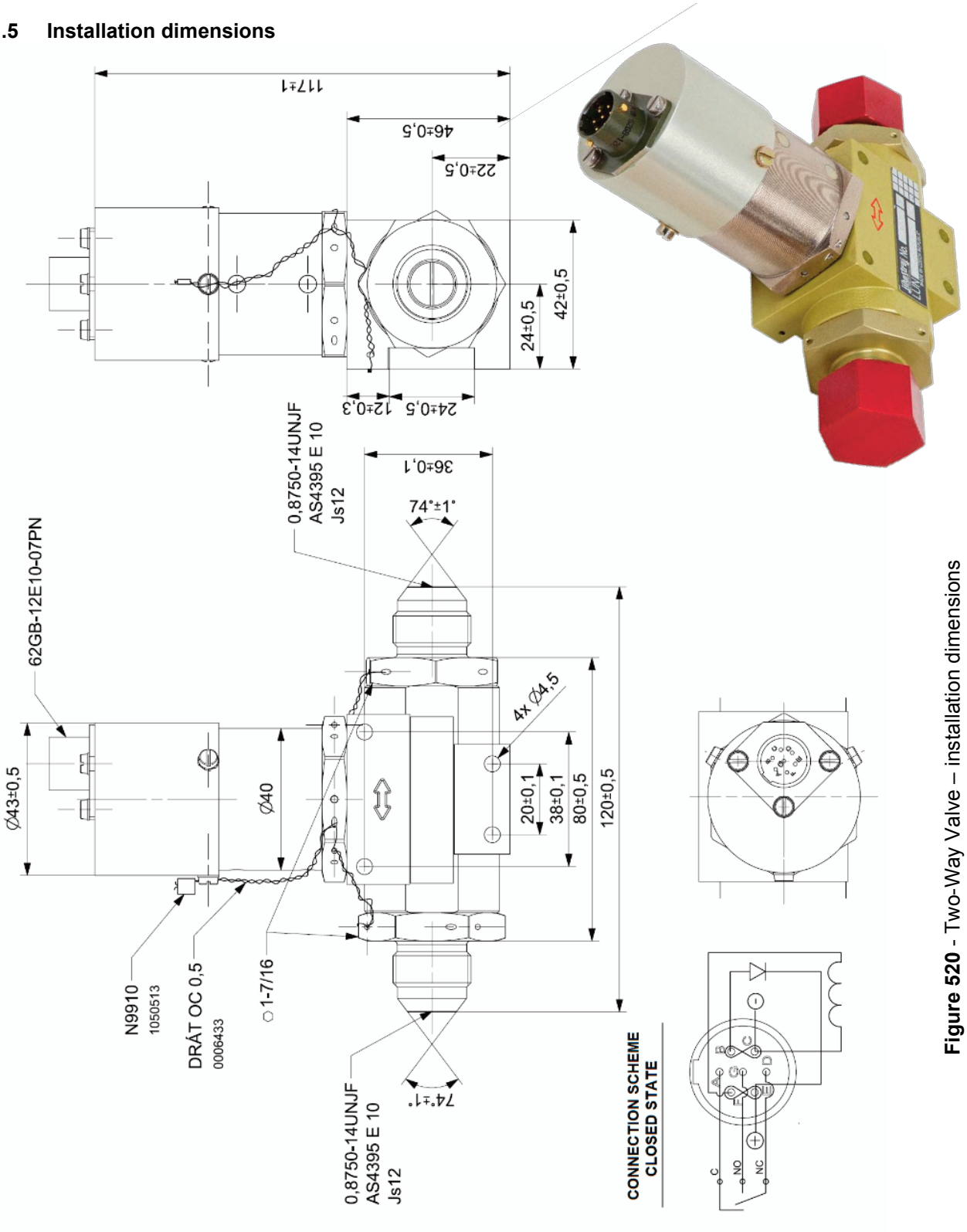


Figure 520 - Two-Way Valve – installation dimensions

5.2 Three-Way Valve LUN 7462.xx

5.2.1 Description

The Three-Way Valve distributes fuel flow from (inlet) port 3 to port 1 or port 2. The Valve is of a poppet type design and is operated electrically. The poppet is actuated with an electromagnetic actuator. The Valve is locked magnetically in both positions with permanent magnets. After changing the polarity of electric current, the electromagnetic actuator moves the poppet to the other position. In the event of failure of the supply power, the electromagnetic actuator maintains the last selected position of the Valve. The Valve consumes power only when the poppet changes position.
If the Valve should spontaneously change the selected position, e.g., due to extreme shock, it is automatically switched to the originally selected position again.
The actual position of the Valve is indicated to the cockpit. This signalization indicates the real position of the poppet, not only power supply to the Valve.

5.2.2 Technical parameters

Weight	1,2 kg
Operating temperature	-55 °C to +70 °C
Not operating temperature	-55 °C to +85 °C
Fluid temperature	-55 °C to +60 °C
Fluids	all typical A/C fuels and additives
Altitude	from 0 to 45 000 ft
Operating pressure	200 kPa
Rated flow	600 l/hr
Proof pressure	500 kPa
Internal leakage	20 drops per minute
External leakage	absolutely tight
Nominal voltage	28 Vdc
Current consumption	2.5 A
Operating voltage	22 – 30.2 Vdc
Limiting voltage	18 – 32.2 Vdc

5.2.3 Technical life, Maintenance, MTBF

Technical life	unlimited
Maintenance mode	on condition
MTBF	over 30 000 flight hours

Note: Unlimited life means that the product can be operated until the first malfunction without any regular maintenance. It must be defined by aircraft manufacturer whether this unlimited life can be applicable.

5.2.4 Installation dimensions

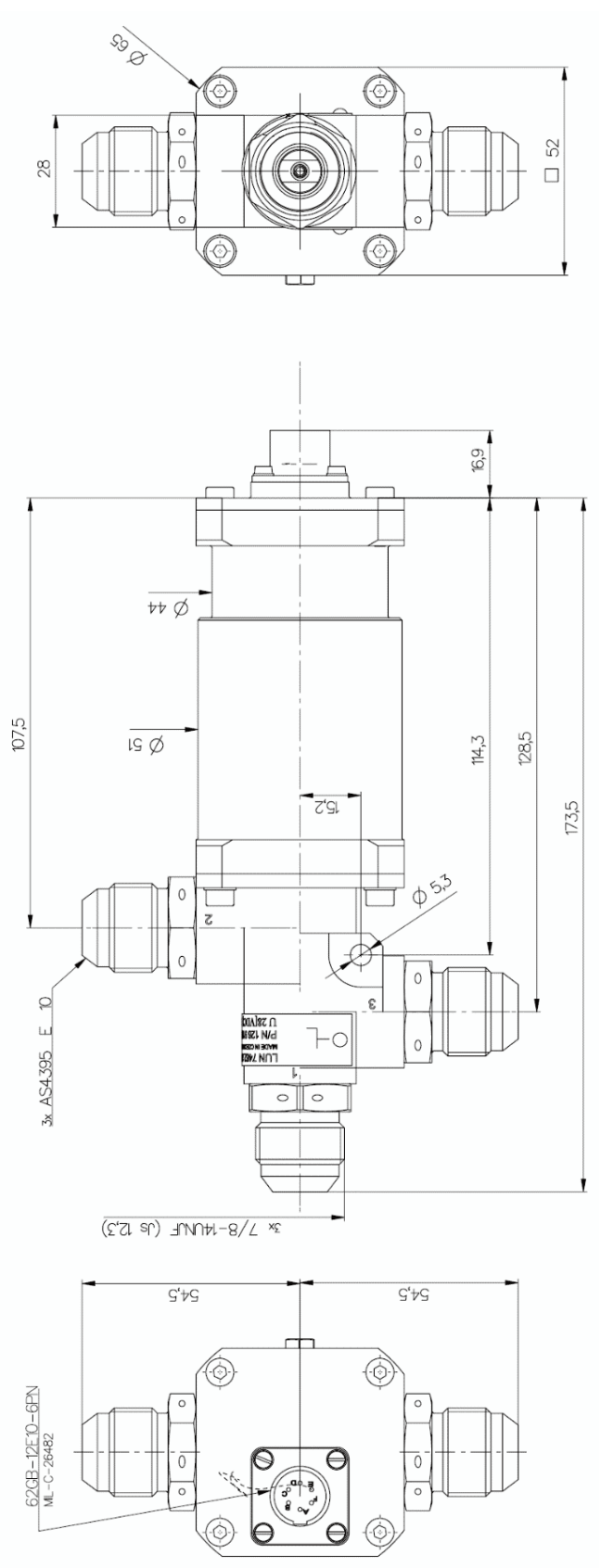


Figure 521 - Three-Way Valve – installation dimensions

5.3 Shut-off Valve LUN 7464.xx

5.3.1 Description

The Shut-Off Valve shuts off the fuel to the engine. The Valve is a poppet type design and is operated electrically. The poppet is actuated with a electromagnetic actuator. The Valve is locked magnetically in both positions with permanent magnets. After changing the polarity of the electric current, the electromagnetic actuator moves the poppet to the other position. In the event of failure of the supply power, the electromagnetic actuator maintains the last selected position of the Valve. The Valve consumes power only when the poppet changes position.
If the Valve should spontaneously change selected position, e.g., due to extreme shock, it is automatically switched to the originally selected position again.
The actual position of the Valve is indicated to the cockpit. This signalization indicates the real position of the poppet, not only power supply to the Valve.

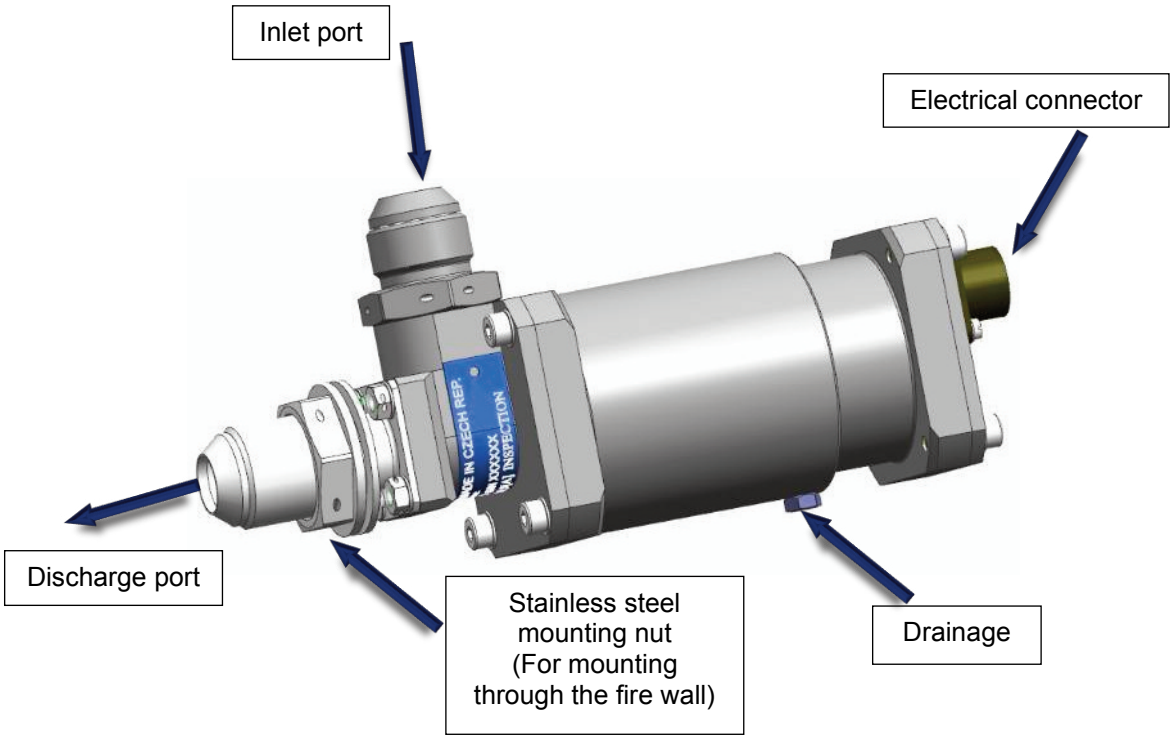


Figure 522 - Shut-off Valve LUN 7464 series

5.3.2 Technical parameters

Weight	0.92 kg
Operating temperature	-55 °C to +70 °C
Not operating temperature	-55 °C to +85 °C
Fluid temperature	-55 °C to +60 °C
Fluids	all typical A/C fuels and additives
Altitude	from 0 to 45 000 ft
Operating pressure	150 kPa
Rated flow	600 l/hr
Proof pressure	500 kPa
Pressure drop (JET A-1, 20 °C)	4 kPa max at flow rate 600 l/hr
Internal leakage	10 drops per minute max.
External leakage	absolutely tight
Nominal voltage	28 Vdc
Current consumption	2.5 A
Operating voltage	22 – 30.2 Vdc
Limiting voltage	18 – 32.2 Vdc

5.3.3 Technical life, Maintenance, MTBF

Technical life	unlimited
Maintenance mode	on condition
MTBF	over 30 000 flight hours

Note: Unlimited life means that the product can be operated until the first malfunction without any regular maintenance. It must be defined by aircraft manufacturer whether this unlimited life can be applicable.

5.3.4 Certification base

Shut-off Valve LUN 7464 series conform to **RTCA/DO-160G**, categories:

Section	Environmental Conditions	Categories
4	Temperature and Altitude	C2
5	Temperature Variation	B
6	Humidity	B
7	Operational Shocks and Crash Safety	B
8	Vibration	S curve T
9	Explosion Proof	A environment I
10	Waterproofness	W
11	Fluid Susceptibility	F
12	Sand and Dust	D
13	Fungus Resistance	F
14	Salt Spray	S
15	Magnetic Effect	B
16	Power Input	B
17	Voltage Spike	A
18	Audio Frequency Conducted Susceptibility-Power Inputs	X
19	Induced Signal Susceptibility	X
20	Radio Frequency Susceptibility (Radiated and Conducted)	X
21	Emission of Radio Frequency Energy	B
22	Lightning Induced Transient Susceptibility	A2E1
23	Lightning Direct Effects	X

Tests marked X are not performed.

5.3.5 Installation dimensions

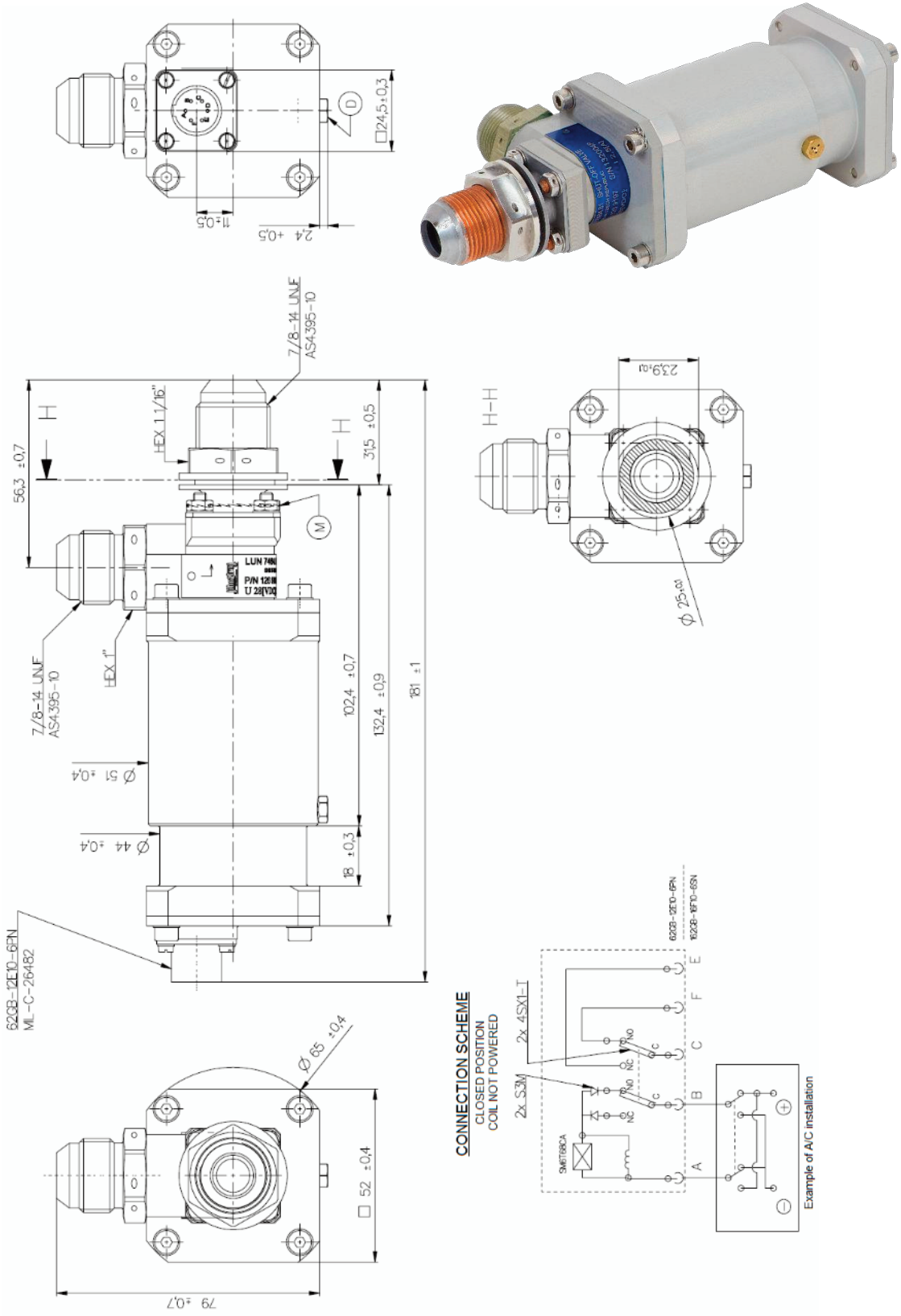


Figure 523 - Shut-off Valve – installation dimensions

5.4 Booster Pump BP-DCA in-line, in-tank

5.4.1 Description

The Booster Pump BP-DCA is designed as an in-line or in-tank installed pump which boosts the fuel from the tank to the main engine fuel pump or to another tank compartment. It can be used for turbine or piston engine applications operating with all typical A/C fuels and additives.
The BP-DCA Fuel Booster Pump is of modular design consisting of a Fuel Pumping Stage, Electric Motor, and Analog Motor Control (AMC-1). A non-return valve can be mounted at the discharge port. The fuel pumping stage is a centrifugal pump consisting of an impeller and stator. The electric motor is a brushless DC motor of wet design. Fuel passes through the motor to lubricate the journal bearings and remove heat from the motor. Gaps and passages inside the Pump secure an explosion-proof design. The impeller is screwed to the armature shaft in the opposite direction of rotation. The armature is supported by journal bearings. The bearings are sleeve type, made of a special carbon grade. The motor is connected to the Pump with four screws. AMC-1 consists of an electronics unit which is sealed in an aluminum housing. The AMC-1 unit consists of the control function (controls start, speed, and maximum current consumption) and the protection function (switches off the electromotor when the defined AMC is overheated, limits the maximal current consumption, and switches off the electromotor in case of undervoltage). The AMC-1 maintains constant RPM at the entire range of operating voltage. Individual functions of the AMC-1 unit are realized only with technical devices (HW). Neither complex hardware nor software are used in the Pump.

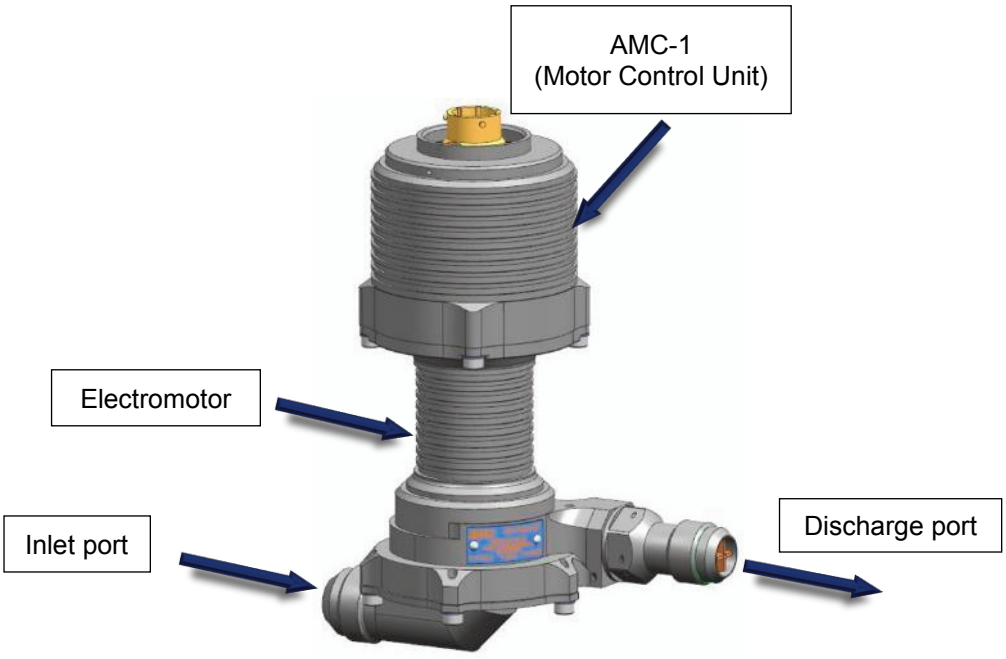


Figure 524 - Booster pump BP-DCA in-line series

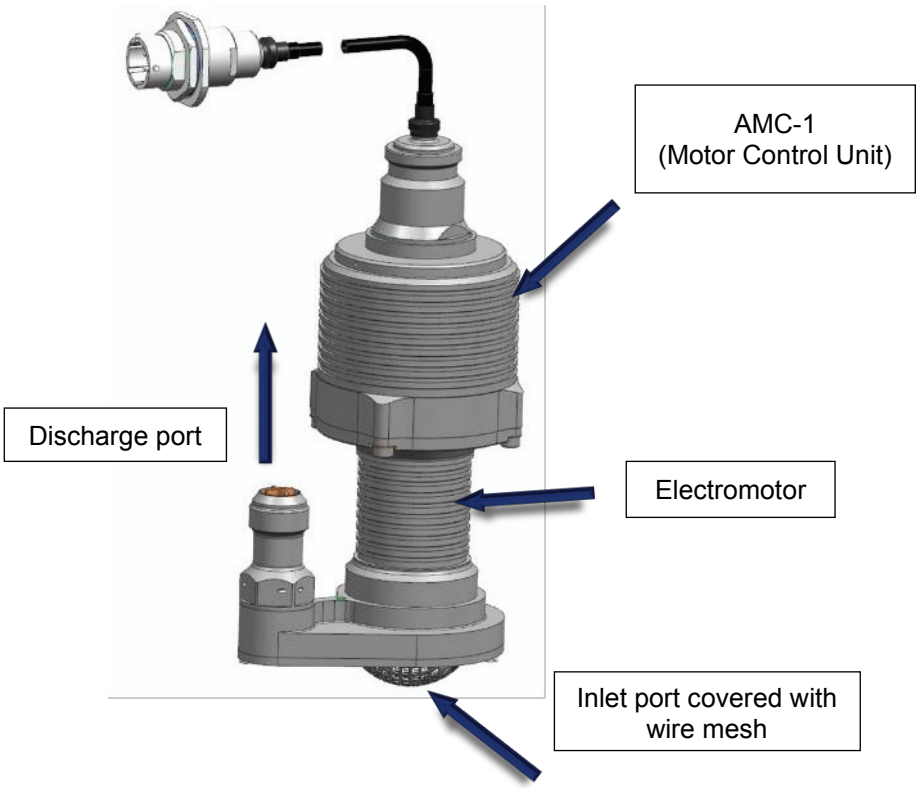


Figure 525 - Booster pump BP-DCA in-tank series

5.4.2 Technical parameters of existing models

Weight	1.35 kg
Operating temperature	-55 °C to +70 °C
Not operating temperature	-55 °C to +85 °C
Fluid temperature	-55 °C to +60 °C
Fluids	all typical A/C fuels and additives
Minimal flow	shall be determined during pump installation
Altitude	from 0 to 35 000 ft
Nominal voltage	28 Vdc
Operating voltage	22 – 30.2 Vdc
Limiting voltage	18 – 32.2 Vdc
Minimal starting voltage	15 Vdc
Maximal current consumption	10 A
RPM adjustable range	5 500 – 10 800 RPM
Inlet pressure	min 15 kPa + TPV

AMC-1 protections

- **Overcurrent protection:**
  AMC-1 limits maximum current consumption of pump: I_{max}= 9,5 ±1 [A].
- **Peak overcurrent protection:**
  In the event of pump malfunction, AMC-1 turns off the pump.
- **Overheating protection:**
  If the temperature of AMC reaches T_{max} = 110 ±6 [°C], AMC-1 turns off the pump. When the temperature decreases, AMC-1 turns on the pump automatically.
- **Zero RPM protection:**
  If the rotor of the electromotor is blocked, AMC-1 turns off the pump.
- **Under voltage protection:**
  If the input voltage decreases under U_{min} = 10 [Vdc], AMC-1 turns off the pump. When input voltage increases to U_{start} = 15 [Vdc], AMC-1 turns on the pump automatically

Booster pump parameters - Discharge pressure vs Flow rate of existing models:

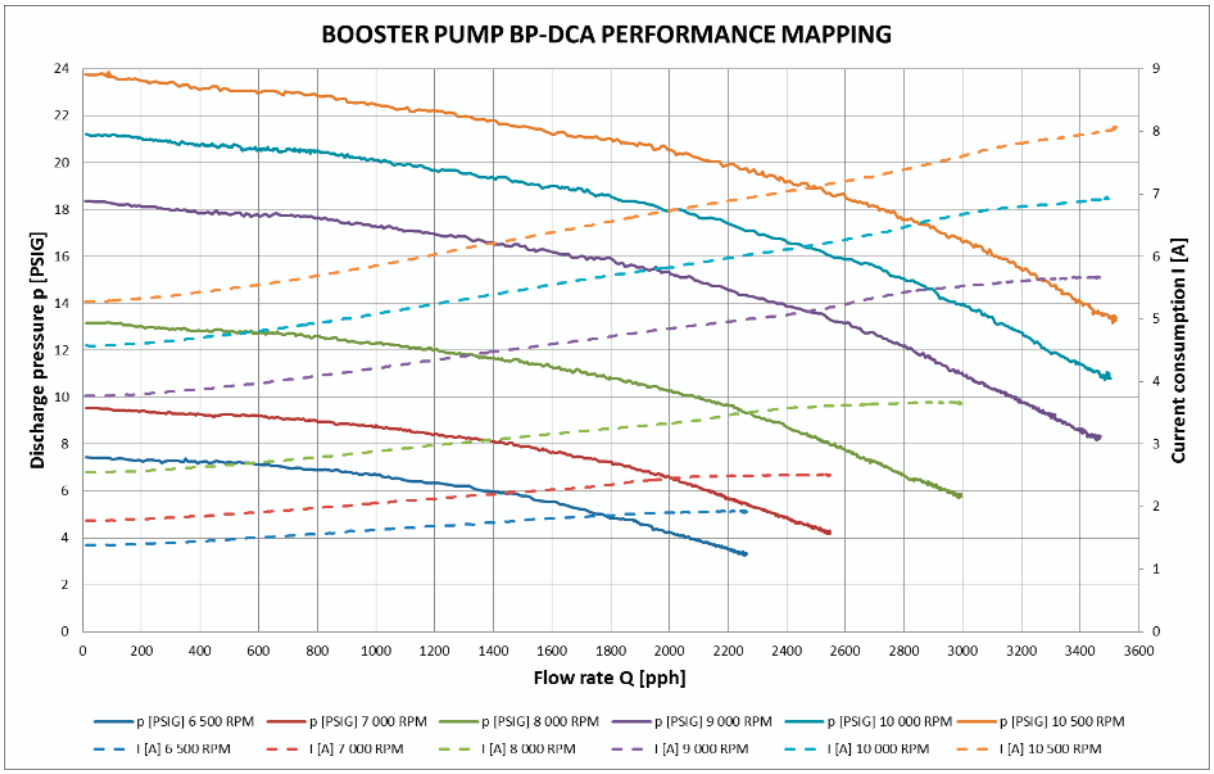


Figure 526 - Booster pump parameters – Discharge Pressure / Current consumption vs. Flow rate

5.4.3 Technical life, Maintenance, MTBF

Technical life	unlimited
Maintenance mode	on condition
MTBF	over 30 000 flight hours

Note: Unlimited life means that the product can be operated until the first malfunction without any regular maintenance. It must be defined by aircraft manufacturer whether this unlimited life can be applicable.

5.4.4 Certification base

Booster Pump BP-DCA series conform to **RTCA/DO-160G**, categories:

Section	Environmental Conditions	Categories
4	Temperature and Altitude	C2
5	Temperature Variation	B
6	Humidity	B
7	Operational Shocks and Crash Safety	B
8	Vibration	S curve T
9	Explosion Proof	A environment I
10	Waterproofness	W
11	Fluid Susceptibility	F
12	Sand and Dust	D
13	Fungus Resistance	F
14	Salt Spray	S
15	Magnetic Effect	B
16	Power Input	B
17	Voltage Spike	A
18	Audio Frequency Conducted Susceptibility-Power Inputs	B
19	Induced Signal Susceptibility	ZC
20	Radio Frequency Susceptibility (Radiated and Conducted)	YG
21	Emission of Radio Frequency Energy	B
22	Lightning Induced Transient Susceptibility	A3J3L3
23	Lightning Direct Effects	X

Tests marked X are not performed.

5.4.5 Installation dimensions

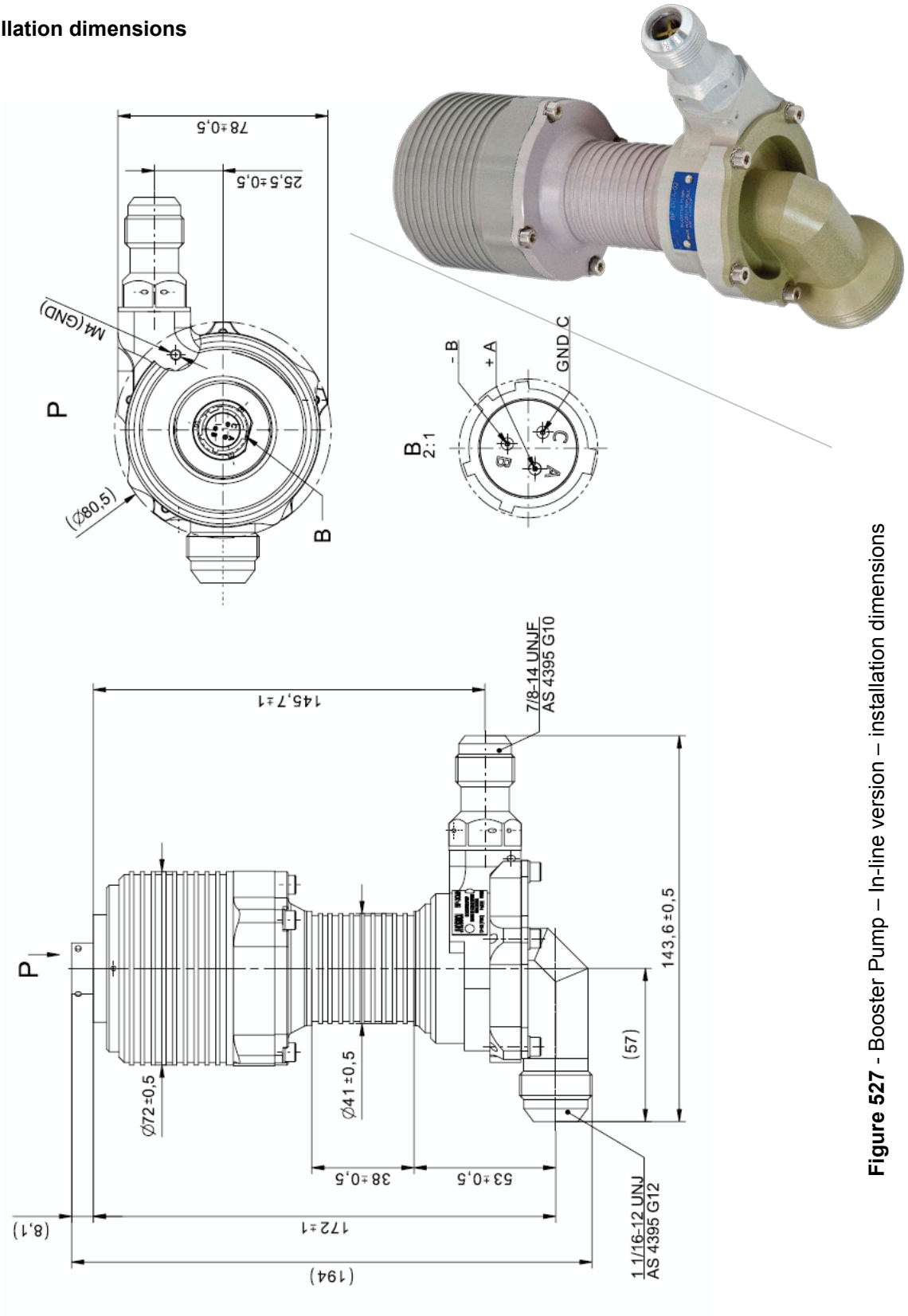


Figure 527 - Booster Pump – In-line version – installation dimensions

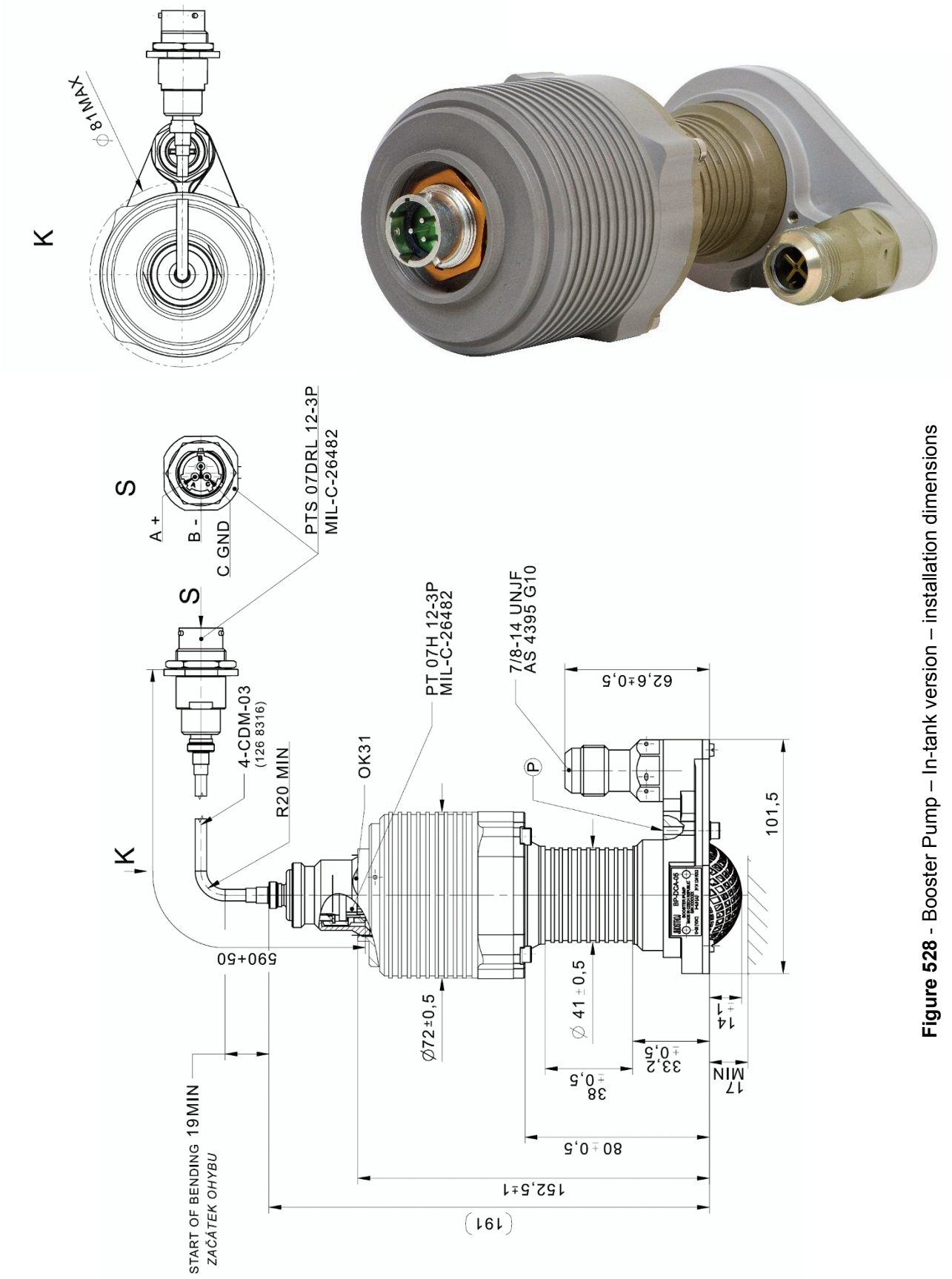


Figure 528 - Booster Pump – In-tank version – installation dimensions

5.5 Fuel Filter FNG-12-xx

5.5.1 Description

The Fuel Filter FNG-12 is a fine fuel filter for turbine or piston engine applications operating with kerosene-based fuels. The Filter is equipped with a bypass valve. Activation of the bypass valve is signalized via a mechanical pop-out clogging indicator which also senses the clogged status of the Filter during operation. Once the status “clogged” is sensed during operation, the indicator will stay actuated until maintenance action is taken to reset it manually. In order to monitor the delta pressure, a pre-clogging electric switch indicator is incorporated in the event of an increase in pressure over the filter element.
The Fuel Filter is equipped with disposable filter element. Water can be drained from the filter bowl with a manually operated drain valve.
The Fuel Filter can be equipped with a vent line which is used for separation of air bubbles in the inlet fuel. There is a nozzle in the vent line fitting to restrict the flow rate in the vent line. This vent line can be plugged.

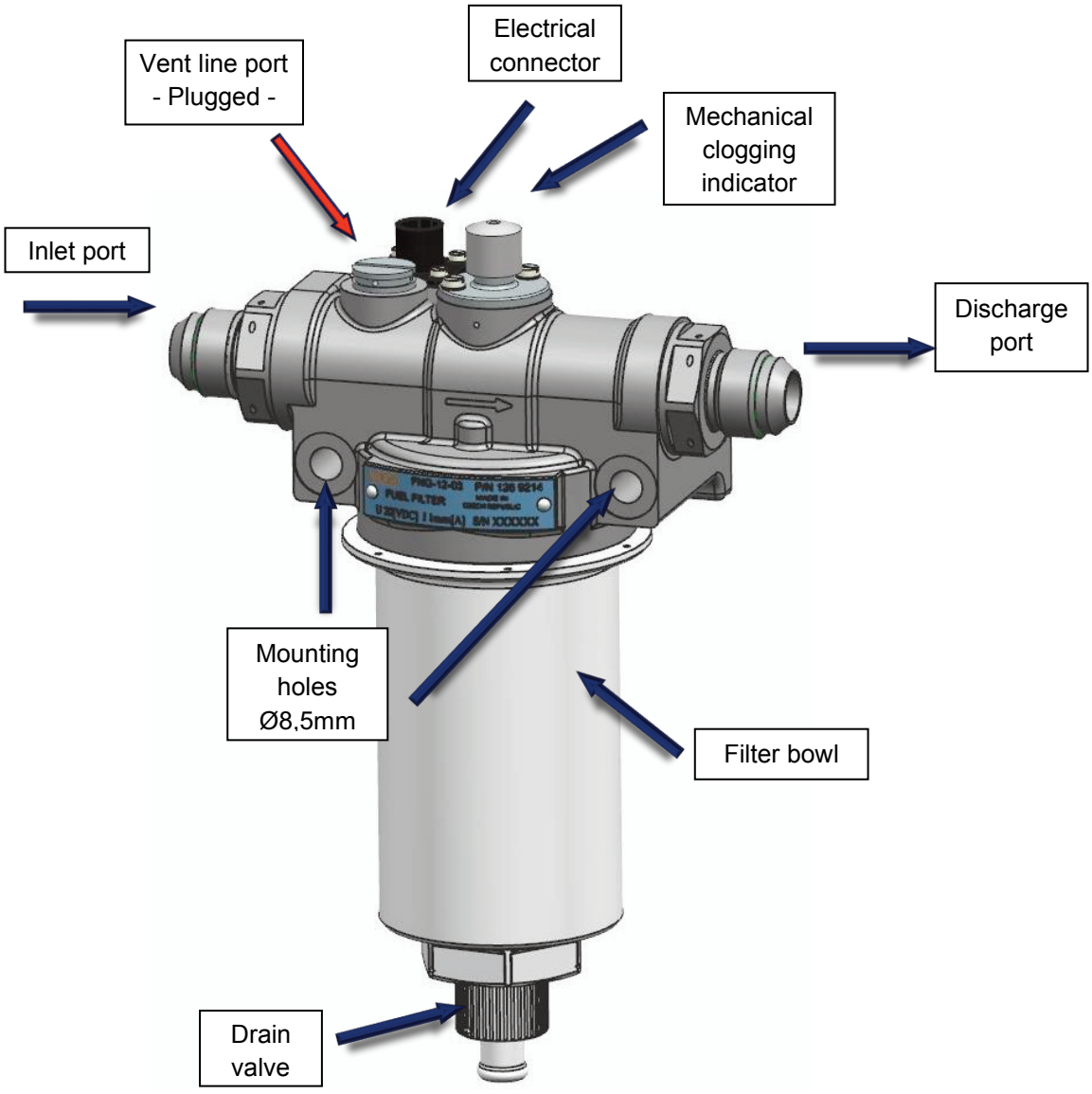


Figure 529 - Fuel Filter FNG-12 series

5.5.2 Technical parameters

Weight	0.85 kg
Operating temperature	-55 °C to +70 °C
Not operating temperature	-55 °C to +85 °C
Fluid temperature	-55 °C to +60 °C
Fluids	all typical A/C fuels and additives
Altitude	from 0 to 45 000 ft
Maximal inlet pressure	300 kPa
Rated flow	400 l/hr*
Proof pressure	500 kPa
Pressure drop (JET A-1, 20 °C, clean filter element)	6 kPa max at flow rate 400 l/hr*
Indication of filter element contamination	15 ±5 kPa diff**
Cracking pressure of Bypass valve	25 ±5 kPa diff**
Filter element	12 MICRON ABSOLUT (Beta ratio > 200)
External leakage	absolutely tight
Nominal voltage	28 Vdc
Operating voltage	22 – 30.2 Vdc
Limiting voltage	18 – 32.2 Vdc

** It is possible to use the filter at higher flow rate; the pressure drop will increase, see figure 230.*

*** It is possible set the signalization to (for higher flow rates):*

Indication of filter element contamination	*25 ±5 kPa diff***
Cracking pressure of bypass valve	*35 ±5 kPa diff***

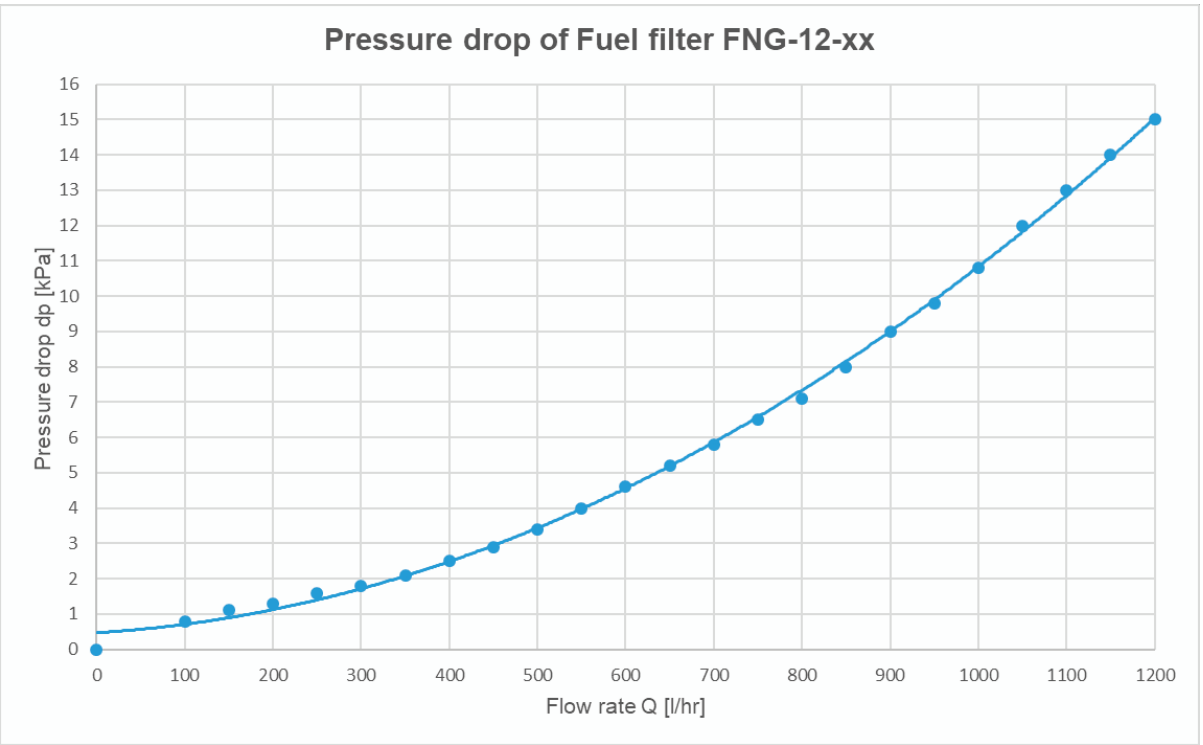


Figure 530 - Pressure drop of Fuel Filter FNG-12-xx

NOTE: Data presented in figure 3-32 are informative only, valid for a filter with a straight fitting according AS4395, size 10, and filter element 12 MICRO absolute.

5.5.3 Technical life, Maintenance, MTBF

Technical life	unlimited
Maintenance mode	on condition
MTBF	over 30 000 flight hours

Note: Unlimited life means that the product can be operated until the first malfunction without any regular maintenance. It must be defined by aircraft manufacturer whether this unlimited life can be applicable.

5.5.4 Certification base

Fuel Filter FNG-12 series conform to **RTCA/DO-160G**, categories:

Section	Environmental Conditions	Categories
4	Temperature and Altitude	C2
5	Temperature Variation	B
6	Humidity	B
7	Operational Shocks and Crash Safety	B
8	Vibration	S curve T
9	Explosion Proof	X
10	Waterproofness	W
11	Fluid Susceptibility	F
12	Sand and Dust	D
13	Fungus Resistance	F
14	Salt Spray	S
15	Magnetic Effect	X
16	Power Input	X
17	Voltage Spike	X
18	Audio Frequency Conducted Susceptibility-Power Inputs	X
19	Induced Signal Susceptibility	X
20	Radio Frequency Susceptibility (Radiated and Conducted)	X
21	Emission of Radio Frequency Energy	X
22	Lightning Induced Transient Susceptibility	X
23	Lightning Direct Effects	X

Tests marked X are not performed.

5.5.5 Installation dimensions

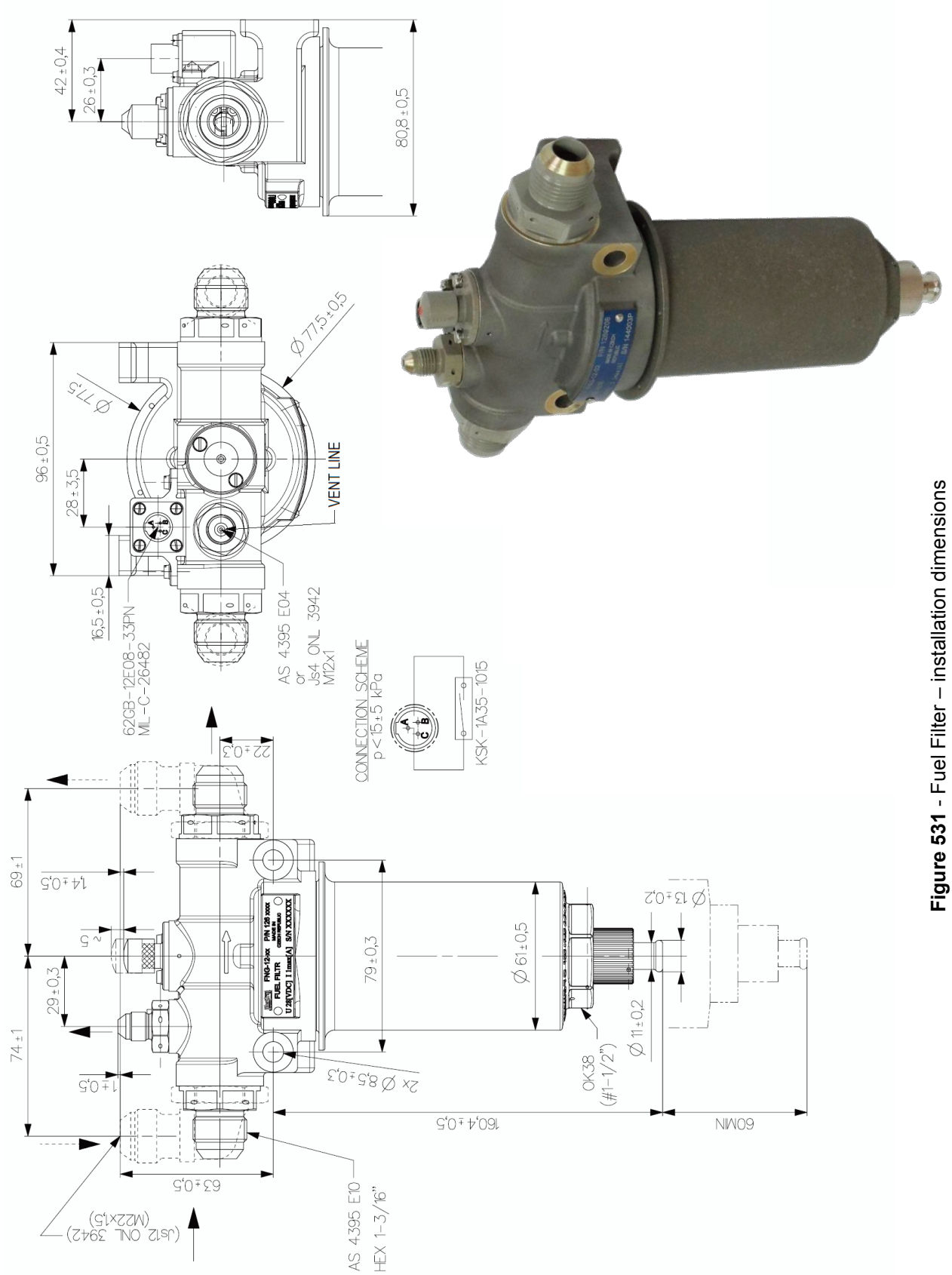


Figure 531 - Fuel Filter – installation dimensions

5.6 Electromagnetic Valve LUN 2475.xx

5.6.1 Description

The Electromagnetic Valve LUN 2475 opens or closes the fuel line. The Valve can be made as either “normally OPEN” or “normally CLOSED” variant.
The Valve is a poppet type design in which the poppet is operated with a solenoid.
Normally OPEN variant:
The poppet is pushed with a spring to the OPEN position when deenergized.
The poppet is pulled to the CLOSED position with a solenoid when energized.
Normally CLOSED variant:
The poppet is pushed with a spring to the CLOSED position when deenergized.
The poppet is pulled to the OPEN position with a solenoid when energized.
.

Figure 532 - Electromagnetic Valve LUN 2475 series

5.6.2 Technical parameters

Weight	0.4 kg
Operating temperature	-60 °C to +100 °C
Not operating temperature	-60 °C to +125 °C
Fluid temperature	-60 °C to +100 °C
Fluids	all typical A/C fuels and additives
Altitude	from 0 to 45 000 ft
Operating pressure	250 kPa
Rated flow	150 l/hr
Proof pressure	500 kPa
Pressure drop (JET A-1, 20 °C)	4 kPa max. at flow rate 100 l/hr
Internal leakage	0,5 lpm max.
External leakage	absolutely tight
Nominal voltage	28 Vdc
Current consumption	1.5 A
Operating voltage	22 – 30.2 Vdc
Limiting voltage	18 – 32.2 Vdc

5.6.3 Technical life, Maintenance, MTBF

Technical life	unlimited
Maintenance mode	on condition
MTBF	over 30 000 flight hours

Note: Unlimited life means that the product can be operated until the first malfunction without any regular maintenance. It must be defined by aircraft manufacturer whether this unlimited life can be applicable.

5.6.4 Certification base

Electromagnetic valve LUN 2475 series conforms to **ENLG-S** categories:

Environmental Conditions	Categories
Temperature	TIII
Altitude	DR II
Humidity	VL II
Operational Shocks and Crash Safety	U III, UL
Vibration	V V/IV, zone A
Explosion Proof	VS V X
Waterproofness	VD I
Sand and Dust	PP I
Fungus Resistance	PG
Salt Spray	TM II

Tests marked X are not performed.

5.6.5 Installation dimensions

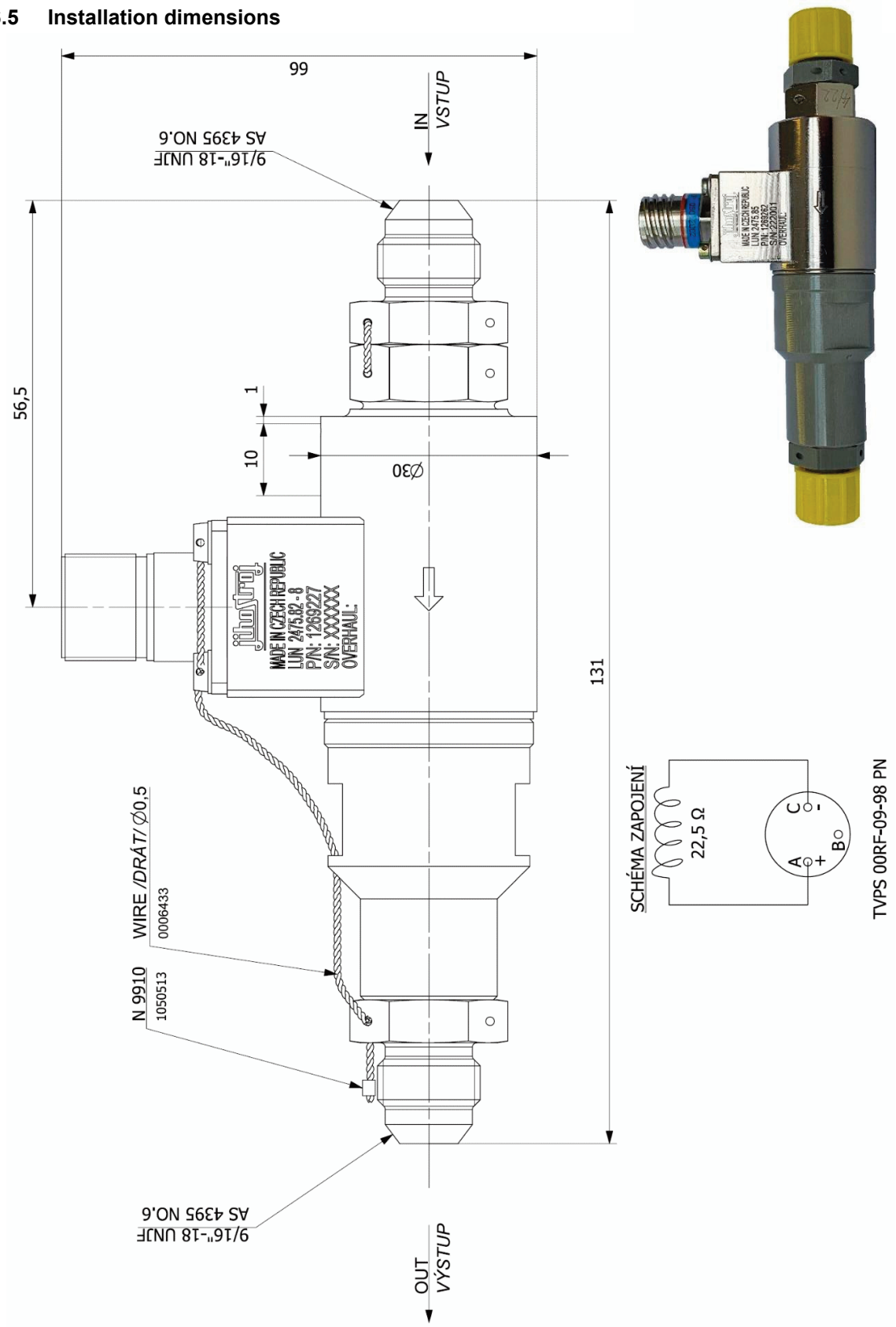


Figure 533 - Electromagnetic Valve – installation dimensions

5.7 Gate Valve LUN 7322.xx

5.7.1 Description

The Gate Valve LUN 7322.xx is a manually operated gate valve. Because of its compact size and low weight, it can be used at fuel lines for maintenance purposes.

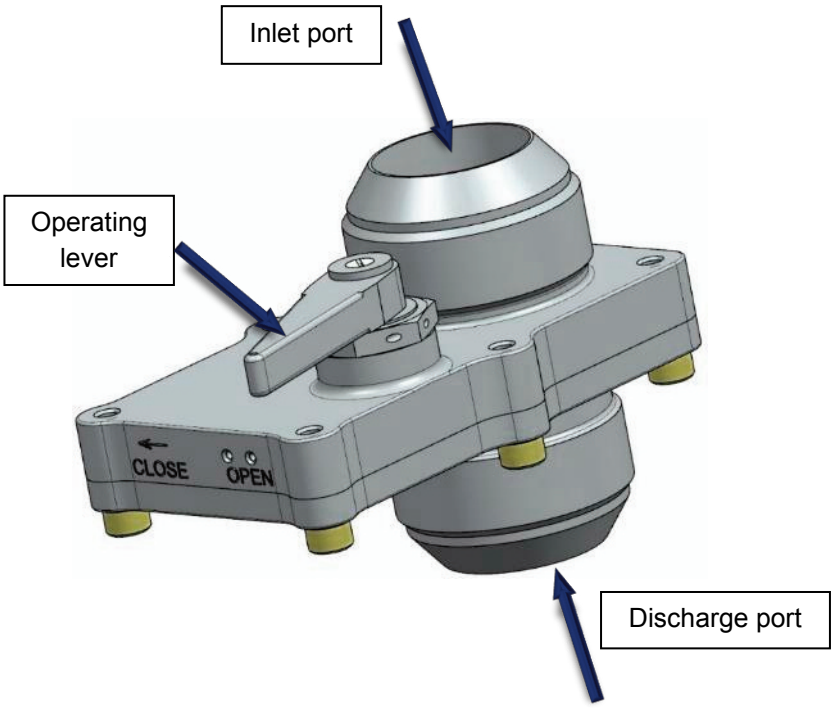


Figure 534 - Gate Valve LUN 7322 series

5.7.2 Technical parameters

Weight	0.42 kg
Operating temperature	-55 °C to +70 °C
Not operating temperature	-55 °C to +85 °C
Fluid temperature	-55 °C to +60 °C
Fluids	all typical A/C fuels and additives
Altitude	from 0 to 45 000 ft
Maximal Operating pressure	100 kPa
Proof pressure	500 kPa
Internal leakage	absolutely tight
External leakage	absolutely tight

5.7.3 Technical life, Maintenance, MTBF

Technical life	unlimited
Maintenance mode	on condition
MTBF	over 200 000 flight hours

Note: Unlimited life means that the product can be operated until the first malfunction without any regular maintenance. It must be defined by aircraft manufacturer whether this unlimited life can be applicable.

5.7.4 Certification base

Gate Valve LUN 7322 series conforms to **RTCA/DO-160G**, categories:

Section	Environmental Conditions	Categories
4	Temperature and Altitude	C2
5	Temperature Variation	B
6	Humidity	B
7	Operational Shocks and Crash Safety	B
8	Vibration	S curve T
9	Explosion Proof	X
10	Waterproofness	W
11	Fluid Susceptibility	F
12	Sand and Dust	D
13	Fungus Resistance	F
14	Salt Spray	S
15	Magnetic Effect	X
16	Power Input	X
17	Voltage Spike	X
18	Audio Frequency Conducted Susceptibility-Power Inputs	X
19	Induced Signal Susceptibility	X
20	Radio Frequency Susceptibility (Radiated and Conducted)	X
21	Emission of Radio Frequency Energy	X
22	Lightning Induced Transient Susceptibility	X
23	Lightning Direct Effects	X

Tests marked X are not performed.

5.7.5 Installation dimensions

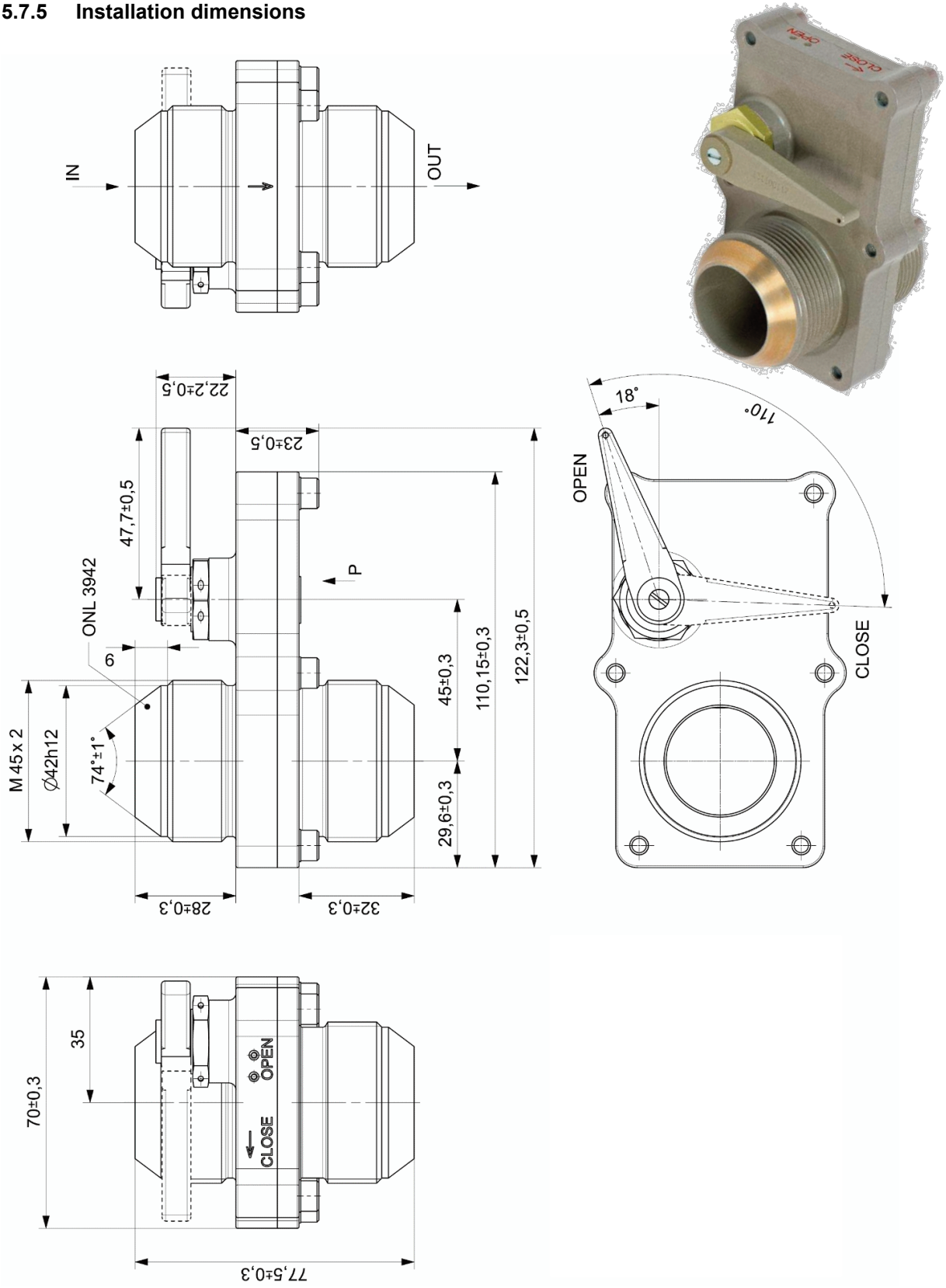
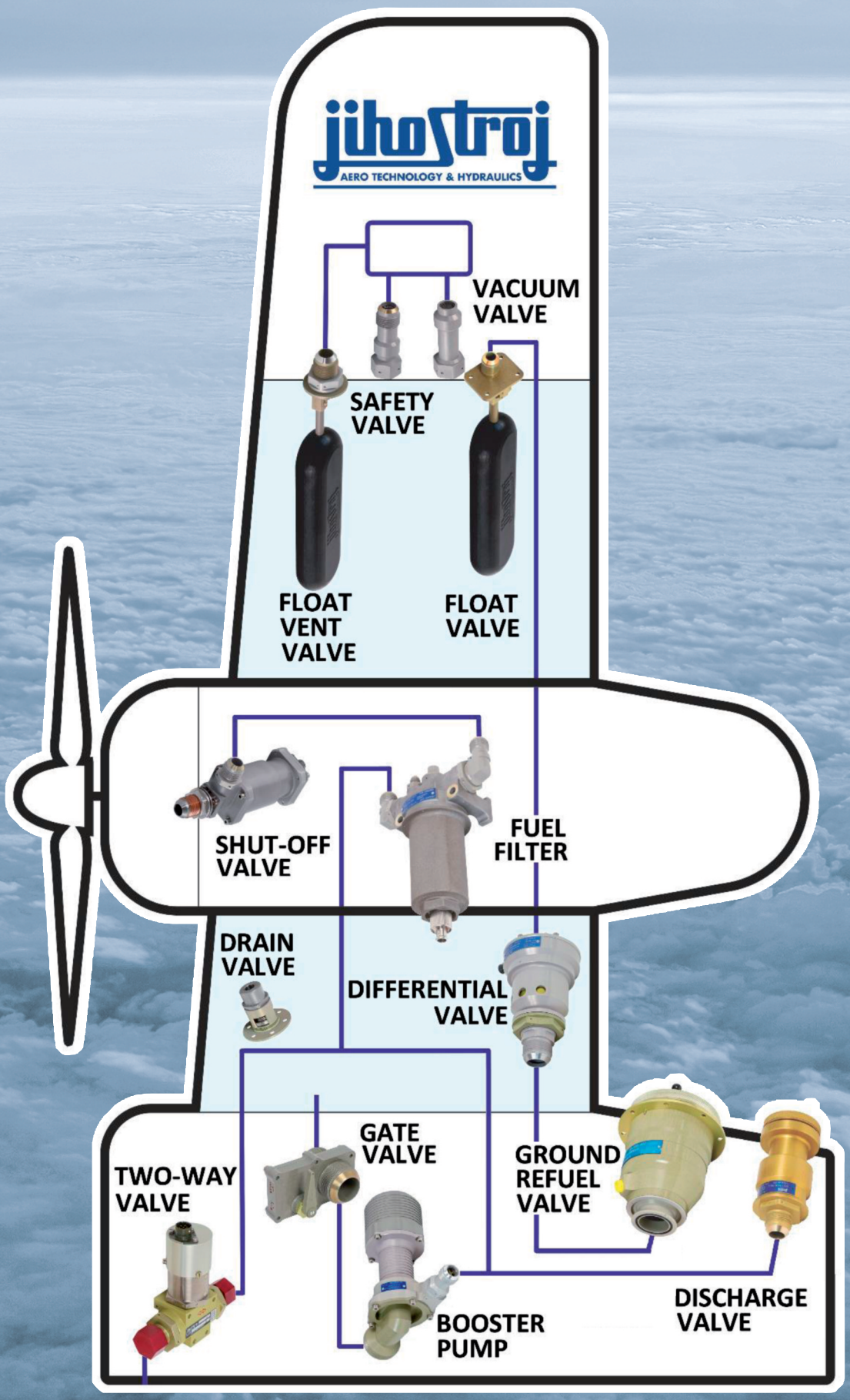


Figure 535 - Gate Valve – installation dimensions



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