Public Joint Stock Company
"Volchansk aggregate plant»

AGGREGATES FOR AIRCRAFT AND HELICOPTERS

Public Joint Stock Company
"Volchansk aggregate plant»

"Volchansk Aggregate Plant" is closely working with leading machine-building enterprises of Ukraine and CIS countries.

Public Joint Stock Company "Volchansk Aggregate Plant" (PAO VAZ) is a dynamically developing enterprise on design, production and testing facilities.

Modern market-based approach to the management of the company is focused on rapid response to changing consumer demands, legislation, the optimal use of human, material and financial resources. The company regularly carries out optimization of the organizational structure, expanding and updating its capacity, develop new products, innovative processes, enhances service and dealer network.

The main activities:

- Development and production of hydraulic and combined hydraulic and electro-pneumatic aircraft components;
- Development and production of fuel equipment, control units and regulation of gas turbine engines for the oil and gas and energy industries;
- Design and manufacture of pneumatic combined hydro-and electro units of automobile vehicles.

High quality products of Public Joint Stock Company "Volchansk Aggregate Plant" is recognized by consumers, as well as it has repeatedly confirmed by honorary diplomas and awards of Ukraine and international organizations.

The quality management system of PJSC "VAZ" is certified for compliance with ISO/TS 16949 international standards: 2009, to EN ISO 9001: 2008, DSTU ISO 9001: 2009 (ISO 9001: 2008).

Company PJSC "VAZ" is focused on the continuous improvement of its product quality.

An integrated approach to the operation of the QMS PJSC "VAZ", due to the requirements of international standards has allowed the company to create an effective business management model that focuses on sustainable development.

Public Joint Stock Company "Volchansk Aggregate Plant" is always open to partnerships with stakeholders around the world.

TÜV PROFI CERT

CERTIFICATE

Management system as per

DIN EN ISO 9001:2008

Evidence of conformity with the above standard(s) has been furnished and is certified in accordance with TÜV PROFICERT procedures for

Public Joint Stock Company
Volchansk Aggregate Plant
2, Pushkina st., Volchansk, Kharkov region, 62504,Ukrai

scope:

Design, manufacture and maintenance of units for aircraft, vehicles, tractors, compressor units of gas pipelines and stand-alone power units.

Certificate registration No. 73 100 4200 | Certificate valid from 2013-04-22 to

Audit report No. 4253 7053 | First certification 2013-04-26

УКРАЇНА
ДЕРЖАВНА АВІАЦІЙНА СЛУЖБА УКРАЇНИ

UKRAINE
STATE AVIATION ADMINISTRATION OF UKRAINE

СЕРТИФІКАТ СХВАЛЕННЯ ОРГАНІЗАЦІЇ З ТЕХНІЧНОГО ОБСЛУГОВУВАННЯ
MAINTENANCE ORGANISATION APPROVAL CERTIFICATE

НОМЕР СХВАЛЕННЯ: UA.145.0075
REFERENCE:

Публічне акціонерне товариство "Вовчанський агрегатний завод"
Public Joint Stock Company "Volchansk aggregate plant"

Україна, 62504, Вовчанськ, Харківська обл., вул. Пушкіна. 2
2, Pushkin Str., Volchansk, Kharkiv region, Ukraine, 62504

УМОВИ:
CONDITIONS:

Дата первинної видачі: 16.07.2013
Дата переоформлення: ---
Видання №: 01

Голова
Chairman
А. Колісник
A. Kolisnyk

Від компетентного органу:
Державна авіаційна служба України

АА N9013207

УКРАЇНА
ДЕРЖАВНА АВІАЦІЙНА СЛУЖБА УКРАЇНИ

UKRAINE
STATE AVIATION ADMINISTRATION OF UKRAINE

СЕРТИФІКАТ
СХВАЛЕННЯ ВИРОБНИЦТВА
PRODUCTION APPROVAL CERTIFICATE

СВ № 0020

Цей Сертифікат, виданий
ПУБЛІЧНОМУ АКЦІОНЕРНОМУ ТОВАРИСТВУ
«ВОВЧАНСЬКИЙ АГРЕГАТНИЙ ЗАВОД»

This Certificate, issued to
PUBLIC JOINT STOCK COMPANY
«VOLCHANSK AGGREGATE PLANT»

62504, Україна, м. Вовчанськ, вул. Пушкіна, 2
2, Pushkina Str., Vovchansk, Ukraine, 62504

засвідчує, що виробництво авіаційної техніки схвалене згідно з Прави
сертифікації виробництва авіаційної техніки для типів авіаційної техніки
зазначені в Додатку до цього Сертифіката, який є невід'ємною його части
certifies that production of aviation products is approved in accordance with "Ru
Production Certification of aviation products" for the types of aviation products listed in
the Appendix to this Certificate, which is a part hereof.

Голова
Chairman
Д. Антонюк
D. Antonyuk

Дата набрання чинності
Effective date
06.05.2014

Цей Сертифікат дійсний до
This Certificate is valid till
06.05.2016

АА N9014345

УКРАЇНА
ДЕРЖАВНА АВІАЦІЙНА СЛУЖБА УКРАЇНИ

UKRAINE
STATE AVIATION ADMINISTRATION OF UKRAINE

СЕРТИФІКАТ
РОЗРОБНИКА АВІАЦІЙНОЇ ТЕХНІКИ
APPROVAL CERTIFICATE
OF AERONAUTICAL PRODUCTS DESIGN ORGANISATION

СР № 0022

Цей Сертифікат виданий
ПУБЛІЧНОМУ АКЦІОНЕРНОМУ ТОВАРИСТВУ
«ВОВЧАНСЬКИЙ АГРЕГАТНИЙ ЗАВОД»
This Certificate, issued to PUBLIC JOINT STOCK COMPANY
«VOLCHANSK AGGREGATE PLANT»

62504,Україна, м. Вовчанськ, вул. Пушкіна, 2
2, Pushkina Str., Vovchansk, Ukraine, 62504

і засвідчує, що утримувача цього Сертифіката визнано як розробника авіаційної техніки
It is hereby certified that the holder of the Certificate is approved as an Aeronautical Products Design Organisation

УМОВИ:
Перелік схвалень, категорій авіаційної техніки, переліс авіаційної техніки та привілеї зазначені в Додатку до цього Сертифіката, який є невід'ємною його частиною.
Цей Сертифікат видано відповідно до ТП АПУ-213.
Цей Сертифікат є дійсним, доки діяльність організації відповідає процедурам Настанови з проектування РП7.3-816-01-2010.
Цей Сертифікат є дійсним, доки його не буде анульовано або якщо організація не відмовиться від нього.

CONDITIONS:
Scope of approval, Categories of aeronautical products, List of the aeronautical products and Privileges are given in the Appendix to this Certificate which is an integral part hereof.
This Certificate is issued according to the requirements of the GP ARU-213.
This Certificate is valid whilst an activity of the approved Aeronautical Products Design Organisation remains in compliance with the procedures of the Design Organisation Handbook PI7.7.3-816-01-2010.
This Certificate is valid until, if it is not surrendered, suspended or revoked by the Design Organisation.

Голова
Chairman
Д. Антонюк
D. Antonyuk

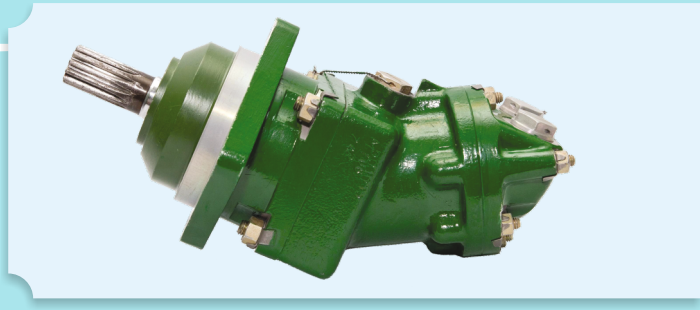
Дата видачі
Date of issue
06.05.2014

Цей Сертифікат дійсний до
This Certificate is valid till
06.05.2016

АА N9014346

HYDRAULIC MOTOR ГМ35

Object of application	Plane Be-12
Purpose	Winch drive with infinitely variable speed from a minimum to a maximum value in both rotational directions
Working fluid	АМГ -10
Working fluid operation temperature range	From -60°C to +60°C
Operation temperature range of ambient medium	From -60°C to +60°C
Maximum speed	2500 rev/min
Maximum working pressure	Maximum -145 kgf/cm^2 Nominal - 110 kgf/cm^2
Tank drain adapter pressure	No more than 5 kgf/cm^2
Outlet adapter back-pressure	No more than 10 kgf/cm^2
Specific consumption	37 cm^3 /rev
Torque effect to the hydraulic motor shaft (at differential pressure of 135 kgf/cm^2)	570 kgf*cm
Dry weight	No more than 7.9 kg

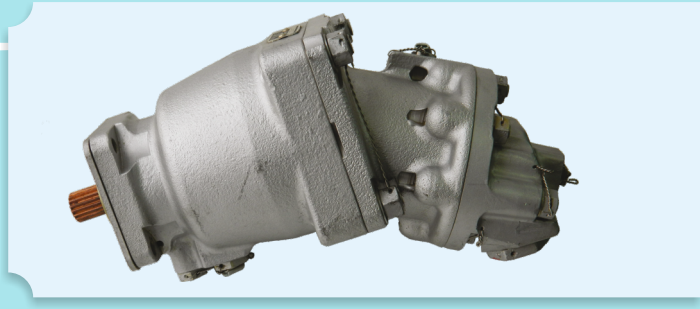


HYDRAULIC MOTOR ГМ36/1

Object of application	AN-8, AN-12, AN-24, AN-26, AN-30, AN-32, Yak-28
Purpose	Drive of mechanisms with continuous variable speed from a minimum to a maximum value in both directions of the rotational shaft
Working fluid	АМГ-10
Working fluid operation temperature range	From -60°C to +90°C
Ambient operation temperature range	From -60°C to +60°C
Maximum speed	3025 rev/min
Maximum operating pressure at the inlet of the hydraulic motor	160 kgf/cm^2
Pressure by the drain adapter (connection)	no more than 5 kgf/cm^2
The back pressure by the outlet adapter (operating on liquid and air)	no more than 20 kgf/cm^2
Specific consumption	11.5 cm^3/rev
Shaft torque of hydraulic motor (at differential pressure of 160 kgf/cm^2 and locked shaft)	no less than 150 kgf*cm
Dry weight	No more than 4.0 kg

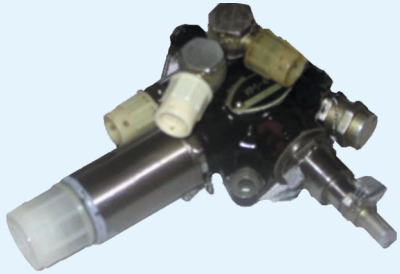
HYDRAULIC MOTOR ГМ40

Object of application	Su-17, Su-24, AN-72, AN-74, AN-22
Purpose	Drive of mechanisms with continuous variable speed from a minimum to a maximum value in both directions of the rotational shaft
	Drive of stabilizer transfer mechanism, drive of flaps control, turning the nozzle of the aircraft engine
Working fluid	АМГ -10 Т-1, ТС-1, РТ
Working fluid operation temperature range	From -60°C to +120°C (for АМГ-10) -40°C…+95°C (for Т-1, ТС-1, РТ)
Operation temperature range of ambient medium	From -60°C to +100°C
Maximum speed	2700 rev/min
Maximum working pressure	180 kgf/cm^2
Tank drain adapter pressure	No more than 3 kgf/cm^2
Outlet adapter back-pressure	No more than 10 kgf/cm^2
Specific consumption	13,5 cm^3/rev
Torque effect to the hydraulic motor shaft (at differential pressure of 180 kgf/cm^2)	230 kgf*cm
Dry weight	No more than 4.4 kg



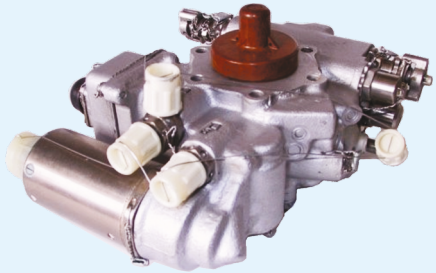
HYDRAULIC MOTOR ГМ40А-3

Object of application	Yak-42D
Purpose	Drive mechanism with continuously variable speed from a minimum to a maximum value in both rotational directions
	Mechanism drive of stabilizer mechanism permutation
Working fluid	АМГ-10
Working fluid operation temperature range	From -60°C to +90°C
Ambient operation temperature range	From -60°C to +60°C
Maximum speed	1500 rev/min
Working pressure	150 kgf/cm^2
Tank adapter working fluid pressure	Not more than 10 kgf/cm^2
Specific consumption	Not more than 11 cm^3/rev
Hydraulic motor shaft torque kgf*cm (at inlet pressure of 150 kgf/cm^2, at outlet of 10 kgf/cm^2 and rotational speed of 1200 rev/min)	180 cm^3 /rev kgf*cm
Dry weight	Not more than 5.2 kg



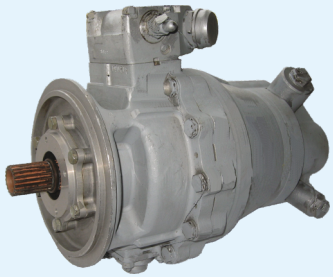
CONTROL ACTUATOR ИМ-40

Object of application	Engine TV 2-117AG for helicopter Mi-8
Purpose	Fuel supply restriction in the engine combustion chamber, by acting on the metering servomechnism of needle of the HP-40BA unit depending on the magnitude and duration of the pulses supplied to the electromagnet valve of assembly
Fuel used	T-1, TC-1, PT as to GOST 10227-86
Working fluid temperature	From - 50°C to +60°C
Ambient temperature	From - 60°C to +60°C
Electromagnetic valve supply	0,6 A
Voltage	27 V
Current	0,6 A
Maximum fuel pressure at input, kgf/cm²	60 kgf/cm²
Dry weight	1.25 kg



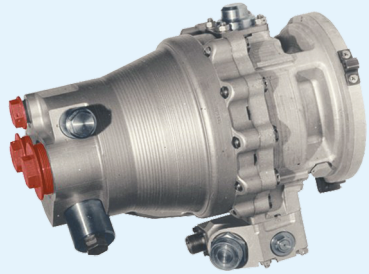
CONTROL PUMP HP9B, HP9B1

Object of application:	
- HP9B	Engine AI-9B of helicopters MI-24, MI-8MTV and engine AI-9 of plane Yak-40, of helicopters Ka-27, Ka-32
- HP9B1	Engine AI-9-3B for plane AN-140
Purpose	Fuel quantity control fed to the engine in all its range of operation and stopping the fuel supply when the engine reaches rpm limits on electric command from the control
Fuel pressure at the inlet	0.6 – 1.7 kgf/cm^2
Maximum number of the HP rotor revolutions for engine	41000±500 rev/min
Maximum fuel consumption	95±10 kg/hr for HP9B 130±10 kg/hr for HP9B1
Minimum fuel consumption	30±30 kg/hr
HP9B sustains physical engine revolutions changing fuel delivery to the engine from maximum fuel rate to a minimum rate keeping accuracy of steady-state revolution of no more than ±0,2% in the specified range	38000 – 39500 rev/min
Minimum voltage of electromagnetic valve actuation at fuel temperature from -50°C to +60°C and ambient temperature from -60°C to +100°C	18 V
Temperature of working fluid at the unit inlet	From -50°C to +60°C
Fuels used	T-1, TC-1, PT
Direction of rotation	Counterclockwise
Weight of product	Not more than 3.4 kg



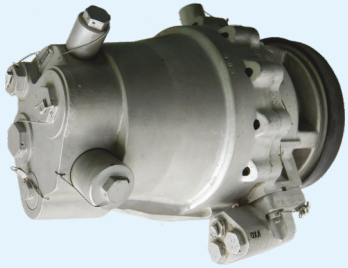
PISTON TYPE PUMP НП107

Object of application	AN-124 "Ruslan", AN-225 "Mriya"
Purpose	Delivery of working fluid into hydraulic system of the object, automatic provision of the required delivery and pump change over in pump unloading mode
Working fluid	АМГ-10
Operating temperature range	From -60°C +100°C
Rotational shaft direction in the pumping mode	Clockwise
Maximum shaft rotational speed	3780 rev/min
Nominal shaft rotational speed	3600 rev/min
Minimal shaft rotational speed	500 rev/min
Zero delivery pressure, kgf/cm²	210 kgf/cm²
Pump inlet pressure	2 – 5 kgf/cm²
Nominal pressure	195 kgf/cm²
Pump delivery rate at nominal pressure	155 l/min
Pressure at drain adapter	5 … 10 kgf/cm²
Delivery of pumping (bilge) pump	10 l/min
Electromagnetic valve supply from DC mains: **Voltage** **Current**	 27 V 1 A
Product weight	20 kg
Service life of the product	3000 l-hrs



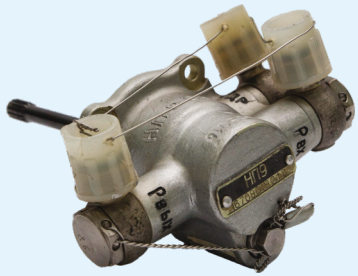
PISTON TYPE PUMP НП107М

Object of application	AN-124 "Ruslan", AN-225 "Mriya"
Purpose	Delivery of working fluid into hydraulic system of the object, automatic provision of the required delivery and pump change over in pump unloading mode
Working fluid	АМГ-10
Operating temperature range	From -60°C to +100°C
Rotational shaft direction in the pumping mode	clockwise
Maximum shaft rotational speed	3780 rev/min
Nominal shaft rotational speed	3600 rev/min
Minimal shaft rotational speed	500 rev/min
Zero delivery pressure kgf/cm²	210 kgf/cm²
Pump inlet pressure	2 – 5 kgf/cm²
Nominal pressure	195kgf/cm²
Pump delivery rate at nominal pressure	155 l/min
Pressure at drain adapter	5 - 10 kgf/cm²
Delivery of pumping (bilge) pump	10 l/min
Electromagnetic valve supply from DC mains: **Voltage** **Current**	 27 V 1 A
Product weight	20 kg
Service life of the product	6000 l-hrs



PUMP-MOTOR UNIT НП107А

Object of application	TU-142(BPMP)
Purpose	Winch drive providing removal and release of cable rope
Working fluid	АМГ-10
Ambient operating temperature range	From -60 °C to +60°C
Operating temperature range of working fluid **With non-running hydraulic system and non-running unit** **With running hydraulic system and running unit**	°C From -60 to +60°C from -30°C to +100°C
Direction of rotational shaft **in pumping mode** **in motor mode**	 Clockwise counterclockwise
Maximum shaft rotational speed	3750 rev/min
Pressure in admission-return line	3 - 5 kgf/cm² (for pump) 4 - 15 kgf/cm² (for motor)
Maximum pressure in control chamber	115 kgf/cm²
Unit delivery at maximum rotational speed and pressure bump between admission and drain of 180 kgf/cm² **pumping mode 1** **pumping mode 2** **motor mode**	 No less than 185 l/min no less than 67 l/min no less than 100 l/min
Weight of product	17.5 kg

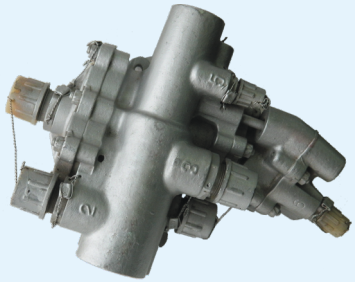


START-UP PUMP НП9

Object of application	Aircraft engine AI-9 for plane Yak-40, helicopters Ka-27, Ka-32
Purpose	introducing fuel into the engine main fuel nozzles from its starting-up and till fuel transition of the engine from governor pump
Direction of rotation	clockwise
Fuel used	T-1, TC-1, PT as to GOST 10227-86
Maximum number of revolutions	18000 rev/min
Fuel pressure at the pump inlet (for all operating modes)	0.6-1/7 kgf/cm^2
Fuel pressure at the pump outlet with P_{in} =1±0,1 kgf/cm^2	2.4-4.5 kgf/cm^2
Fuel temperature at pump inlet	from -50°C to +60°C
Ambient temperature	from -60°C to +100°C
Gear ratio from engine rotor to start-up pump	0.9
Dry weight of the product	0.4kg

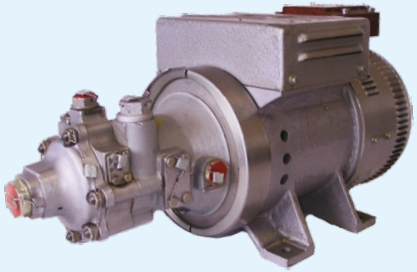
PUMPING STATION HC-3

Object of application	Su-7, Su-15, Su-17, Su-24
Purpose	Working fluid pump-in to the aircraft emergency hydraulic system
Pump inlet pressure	1 kgf/cm²
Maximum pump-in pressure	240 kgf/cm²
Working pump-in pressure	90-185 kgf/cm²
Pump delivery rate **at pump-in pressure 90 kgf/cm²** **at pump-in pressure 185 kgf/cm²**	l/min 3.7 l/min 2.7 l/min
Electric motor type	D-1100
Pump type	Rotary type, not-adjustable
Current type	Direct current (DC)
Amperage	Not more than 70 A
Rated voltage	27 V
Range of working voltage	18 – 30 V
Working fluid	АМГ-10
Arrangement on the object	Horizontal
Weight	12.0 kg



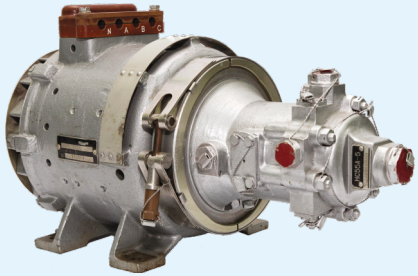
PUMPING STATION HC51A

Object of application	IL-76, IL-76MD, IL-76MD-90
Purpose	Creation of suction head and its automatic pressure make-up in the specified limits of the suction line for aircraft hydraulic pumps in its all operating modes
Working fluid	АМГ-10
Temperature range **- ambient temperature** **- working fluid**	°C From –60°C to +60°C From -60°C to +100°C
Inlet pressure	0,12 - 2,8 atm.
Supply pressure of the pump station hydraulic motor	210 kgf/cm²
Maximum capacity	35 l/min
Differential pressure sustained by the pump station	3 kgf/cm²
Weight	5.0 kg



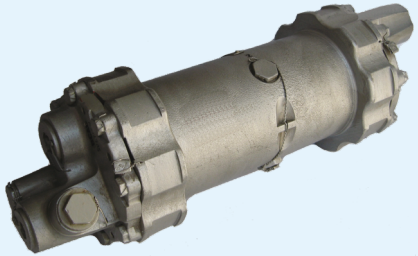
PUMPING STATION HC55A

Object of application	Yak-42D
Purpose	Working fluid supply of the aircraft emergency hydraulic system
Pump inlet pressure	0,4 - 3 kgf/cm^2
Zero delivery pressure	150 kgf/cm^2
Maximum pump-in pressure	160 kgf/cm^2
Nominal (rated) pump-in pressure	150 kgf/cm^2
Working volume	0.6 cm^3/rev
Pump delivery at pump-in pressure of 130 kgf/cm^2, and inlet pressure of 0.7 kgf/cm^2	6.0 l/min
Electric motor type	MP-2,2
Current type	Direct current (DC)
Maximum consumption current	Not more than 140 A
Nominal supply voltage	27 V
Minimum supply voltage	18 V
Working fluid	АМГ-10
Operation temperature range of the ambient air	From -60°C to +60°C
Operation temperature range of working fluid	From -60°C to +100°C
Working fluid purity grade as to GOST–17216-71	8
Weight	16.0 kg



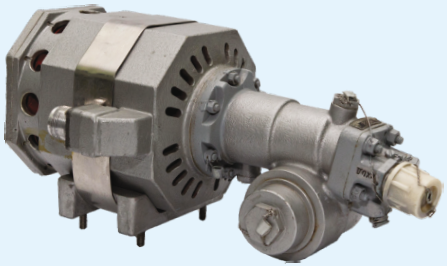
PUMPING STATION HC55A-5

Object of application	AN-70, AN-124
Purpose	Working fluid supply of low-power consumers of hydraulic system for aircraft ground handling operation
Pump inlet pressure	0 – 4.3 kgf/cm^2
Zero delivery pressure	210 kgf/cm^2
Nominal pump-in pressure	190 kgf/cm^2
Working volume	0.6 cm^3/rev
Pump delivery rate at pump-in pressure of 95 kgf/cm^2	No less than 8 l/min
Electric motor type	MT-5,5
Current type	AC three-phase current with frequency of 400 Hz
Maximum consumption current	No more than 35 A
Nominal supply voltage	200 V
Minimum supply voltage	187 V
Working fluid	АМГ-10
Operation temperature range of the ambient air	From -60°C to +60°C
Operation temperature range of working fluid	From -60°C to +100°C
Working fluid purity grade as to GOST–17216-71	8
Weight	13.5 kg



PUMPING STATION HC58

Object of application	MIG-29 KUB
Purpose	Working fluid delivery of the plane booster hydraulic system in emergency mode
Hydraulic pump	
Working fluid	АМГ-10, 7-50С-3
Range of working fluid temperatures in suction mode	From -60°C to +100°C
Inlet pressure	1.5 – 6.0 kgf/cm²
Pump-in pressure at the zero delivery	180…230 kgf/cm²
Flow rate	43 l/min
Hydraulic motor	
Working fluid	Т-1, ТС-1, РТ, Т-6
Temperature range of the working fluid	From -45°C to +100°
Inlet pressure kgf/cm²	190 - 220 kgf/cm²
Consumption	60 l/min
Weight	7.0 kg

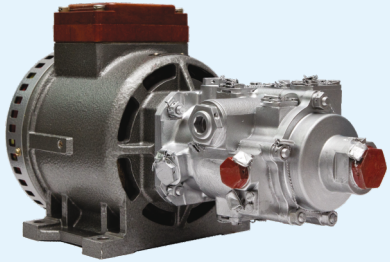


PUMPING STATION HC62

Object of application	AN-124 "Ruslan", AN-225 Mriya"
Purpose	Height control of the specified cargo floor step up by pumping working fluid from the tank into shock-absorber in climbing the aircraft from the landing squatting position
Inlet pump pressure	0-1.2 kgf/cm^2
Maximal pump-in pressure	220 kgf/cm^2
Nominal pump-in pressure	210 kgf/cm^2
Pump delivery	2.5 l/min
Electric motor type	MT-800
Current type	Alternating three-phase current with frequency 400 Hz
Consumed power	Not more than 2200 VA
Rated voltage	200 V
Minimum voltage	187 V
Working fluid	АМГ-10
Working fluid purity grade as to GOST–17216-71	8
NS arrangement on the object	Horizontal
Weight	8.0 kg

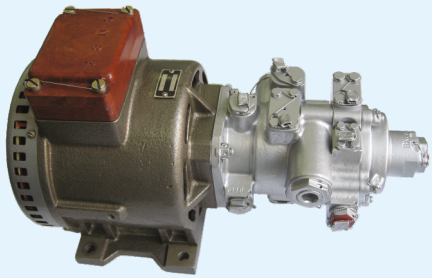
PUMPING STATION HC63

Object of application	AN-124 "Ruslan", AN-225 "Mriya"
Purpose	Pumping over the working fluid from the main tank of the hydraulic system into feeder hydraulic tank
Working fluid	АМГ-10
Working fluid temperature at the inlet	From –60°C to +100°C
Ambient temperature	From –60°C to +100°C
Rated pressure of the working fluid in the hydraulic system feeding the hydraulic motor	210 kgf/cm²
Working fluid pressure at the pump inlet	2-5 kgf/cm²
Working fluid pressure at the outlet of the pump station	15 kgf/cm²
Working fluid flow rate consumed by the hydraulic motor at inlet pressure of 210 kg/cm² and pressure loss at the outlet of the pump station and working fluid temperature and ambient temperature of 25±10 °C	1+0.5 l/min
Pump station delivery rate with working fluid pressure at hydraulic motor inlet of 210 kg/cm² and и pump intake of 2 kg/cm², working fluid temperature and ambient temperature of 25±10°C:	No less than
a) working fluid pressure loss at the outlet of the pump station	4.5 l/min
б) working fluid pressure at the outlet of pump station of 15 kgf/cm²	3,5 l/min
Pressure switch contacts are closed in working temperature and ambient temperature range from –20°C to +100 °C and at pump delivery rate	2 l/min
Voltage of the pressure switch	27 V ±10%
Current passing trough pressure switch contact during the active load	Not more than 0.1 A
Weight	2.0 kg



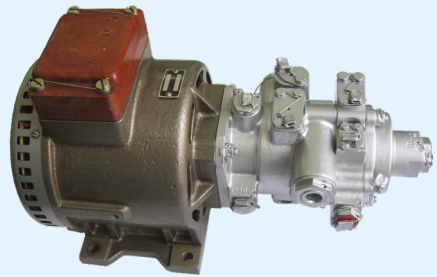
PUMPING STATION HC74

Object of application	IL-114, Be-200, Tu-204S, Tu-334S, iL-96-300PU, IL-96-400T, IL-96-400VPU
Purpose	Main power supply
Working volume см³/об	2 cm^3/rev
Zero delivery rate	210 kgf/cm^2
Pressure at the pump inlet	0.6-5.5 kgf/cm^2
Pump deliver rate at pump-in pressure of 195 kgf/cm²	No less than 7.0 l/min
Pump deliver rate at pump-in pressure of 130kgf/cm²	No less than 10 l/min
Electric motor type	MT-3
Pump type	Variable capacity
Current type	Alternating three phase current with frequency 400 Hz
Consumption current	No more than 22 A
Rated voltage	115/200 V
Working fluid	НГЖ-5У
Working fluid purity grade as to GOST–17216-71	12
NS arrangement on the object	Arbitrary, using drain connection fitting mounted downward, excluding pump position in the up position
Range of operation temperatures of ambient air	From -40°C to +65°C
Operation temperature range of the working fluid, °C	From -40°C to +90°C
Weight	9.7 kg



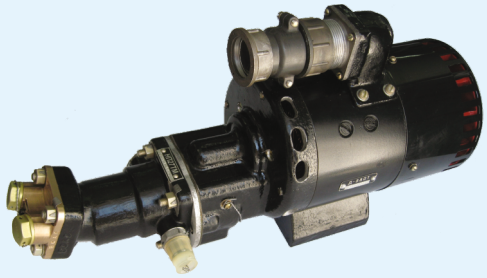
PUMPING STATION HC74-2

Object of application	Mig-110, S80-GP
Purpose	Main power supply
Working volume	2 cm^3/rev
Zero delivery rate	210 kgf/cm^2
Pressure at the pump inlet	0.6-5.5 kgf/cm^2
Pump delivery rate at pump-in pressure of 195 kgf/cm^2	No less than 7.0 l/min
Pump delivery rate at pump-in pressure of 130 kgf/cm^2	No less than 10 l/min
Electric motor type	MT-3
Pump type	Variable capacity
Current type	Alternating three phase current with frequency 400 Hz
Consumption current	22 A
Rated voltage	115/200 V
Working fluid	АМГ-10
Working fluid purity grade as to GOST–17216-71	12
NS arrangement on the object	Arbitrary, using drain connection fitting mounted downward, excluding pump position in the up position
Range of operation temperatures of ambient air	From -40°C to +65°C
Operation temperature range of the working fluid, °C	From -40°C to +90°C
Weight	9.7 kg



PUMPING STATION HC74-3

Object of application	MI-8TV5, Mi-8MTV1, Mi-8MTV3
Purpose	Main power supply
Working volume	2 cm^3/rev
Zero delivery rate	150 kgf/cm^2
Pressure at the pump inlet	0.6-5.5 kgf/cm^2
Pump delivery rate at pump-in pressure of 130 kgf/cm^2	No less than 10 l/min
Electric motor type	MT-3
Pump type	Variable capacity
Current type	Alternating three phase current with frequency 400 Hz
Consumption current	22 A
Rated voltage	115/200 V
Working fluid	АМГ-10
Working fluid purity grade as to GOST–17216-71	12
NS arrangement on the object	Arbitrary, using drain connection fitting mounted downward, excluding pump position in the up position
Range of operation temperatures of ambient air	From -40°C to +65°C
Operation temperature range of the working fluid, °C	From -40°C to +90°C
Weight	9.7 kg



PUMPING STATION НП27ТМ

Object of application	MIG-21, Tu-154S, Mi-8TV5-1, Mi-17
Purpose	Working fluid delivery of the plane emergency hydraulic system
	Fluid power provision of control actuators for helicopter cargo frame
Pump inlet pressure	1-2 kgf/cm^2
Maximum pump-in pressure	210 kgf/cm^2
Working pump-in pressure	185 kgf/cm^2
Pump delivery rate (At pump-in pressure of 185 kgf/cm^2)	1.9 l/min
Electric motor type	D-880T
Pump type	Rotary type. Non-adjustable
Current type	Direct current
Amperage **at pump-in pressure 210 kgf/cm^2** **at pump-in pressure 185 kgf/cm^2**	Not more than A 58 A 52 A
Rated voltage	27 V
Working voltage range	From 20 V to 30 V
Working fluid	АМГ-10
NP arrangement on the object	Horizontal (allowed is vertical position, pump downward)
Weight	8.0 kg

GENERATOR DRIVE ГП27

Object of application	TU-204-120, TU-214, TU-204, TU-234, TU-204-100, TU-204-120S, TU-214S
Purpose	Emergency electric power supply of the object consumers in case of failure (cutting-off) the basic sources of the object power supply
Working fluid	НГЖ-5У
Pump-in pressure at the generator drive input MPa (kgf/cm²)	19-22 MPa (190-220 kgf/cm²)
Drain working pressure	0,2-1 MPa (2-10 kgf/cm²)
Maximally consumable flow rate of the working fluid	Not more than 27 l/min
Voltage at regulation point	27-29 V
Output power of generator	0.3-27 kW
Temperature range of the working fluid	From -55°C to +85°C
Ambient temperature range	From -60°C to +85°C
Dry weight of product	Not more than 15 kg

DRIVE FOR WING DEVICES КПМ-02, КПМ-02А

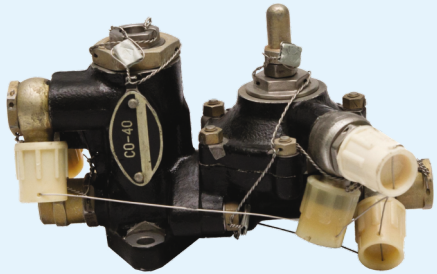
Object of application	AN-140
Purpose	Actuator of aircraft flap system control with their locking in the specified position
Basic mode	
Working fluid	АМГ-10
Working fluid purity grade as to GOST 17216-71	8
Rotational speed of the drive output shaft at differential pressure on hydraulic motor adapters "head-drain" of 140 kgf/cm² and consumption of 4.5+0,3 l/min	210-270 1/min
Working fluid flow rate at 210-2170 rpm	4.5-4.8 l/min
Nominal pressure of working fluid in the head line	150 kgf/cm²
Torque developed by the drive with locked shaft and differential pressure on the "head-drain" adapters of 140 kgf/см², kgf not more	Not more than 3.2 kgf*m,
Hydraulic brake release and output shaft motion start at pressure in the head mainline	Not more than 80 kgf/cm²
Inertial run-down of the output shaft after removal of the control signal	Not more than 1.0 revolution
The current switched by hydraulic brake micro-switch	0.01 – 0.5 A
Working fluid temperature: **- Operation temperature range** **- limit temperature range**	 From -20°C to +100°C From -60°C to +125°C
Stanby operation	
Voltage of drive power supply: **rated** **emergency**	 24 – 29.4 V 18 V
Rotational speed of the output shaft at consumption current of 2 A	Not less than 40 1/min
Rotational speed of the output shaft at rated supply voltage under 3.2 kgf *m load	Not less than 28 1/min
Limit torque on the drive shaft	Not more than 5.3 kgf*m
Maximum load on the drive output shaft kept with brakes at pressure in drain pipeline of 15 kgf/cm² and electrical motor being switched off	4.2-4.5 kgf*m
Drive operating principle: **in basic mode** **in standby mode**	 Hydro mechanical electromechanical
Drive mechanism	Reverse
Forward motion of the output shaft	103 revolutions
Weight of the drive	Not more than 11.5 kg

Object of application	AN-148, AN-158, AN-168 AN-178
Purpose	Movement of wing flaps and slats of the object
Working fluid	Skydrol 500B-4 SAE AS1241B, Skydrol LD-4 SAE, AS1241B, НГЖ-5У as to TU 38.401-58-57-93
Working fluid purity grade as ti GOST 17216-71	8
Working fluid temperature at drive input	From -55°C to +90°C
Ambient temperature	From -60°C to +85°C
Nominal (rated)pressure at drive input	210 kgf/cm²
Working fluid pressure at drain adapter	6-10 kgf/cm²
Forward motion of the output shaft	120 revolutions
Drive operating principle: **in basic mode** **in standby mode**	 Hydro mechanical electromechanical
Power supply of electric motor and electric-hydraulic valves from DC two-wire line with rated voltage	27 V
Basic mode	
Rotational speed of the drive output shaft at differential pressure between inlet and drain, of 180 kgf/cm² with opposing load of 12 kgf*m or supporting load of 7 kgf*m	200±20 revolutions
Torque on the output shaft with the shaft locked and working fluid differential pressure between input and drain of 210 kgf/cm²	Not more than 22 kgf*m,
Torque on the output shaft kept with hydro mechanical brake	Not more than 14 kgf*m
Working fluid consumption during drive operation	Not more than 16 l/min
Braking off the output shaft and its motion start at inlet pressure	Not more than 70 kgf/cm²
Stanby mode	
Rotational speed of the output shaft at opposing load of 10 kgf*m ofr supporting load of 5 kgf*m	No less than 40 1/min
Torque on the output shaft at rotational speed close to zero	Not more than 22 kgf*m
Torque on the output shaft kept by electromechanical brake kgf*m	Not more than 14 kgf*m
Consumption current: **- by electric motor at opposing load of 10 kgf*m applied** **- by electric hydraulic valves**	 Not more than 38 A not more than 0.6 A
Drive weight	Not more than 19.5 kg

DRIVE FOR WING DEVICES КПМ148Н

SPEED GOVERNOR PO-40M

Object of application	Engine TV-2-117AG of helicopter MI-8
Purpose	Keeping of the given rotational speed for the free turbine, engine shutdown in case of free turbine overspeed that exceeds the allowable value
Unit drive	From free turbine through springer
Direction of rotation	Any direction
Fuel maximum pressure at the inlet	60 kgf/cm^2
Drive rotational speed corresponding to rotational speed of unit free turbine equal to 12000 rpm	4050 rpm
Switching frequency of SZTV	5425 rpm
Working fluid	T-1, TC-1, PT
Working fluid temperature range	From -50°C to+60°C
Ambient temperature range	From -60°C to +60°C
Dry weight	Not more than 2.8kg



POWER CYNCHRONIZER CO-40

Object of application	Engine TV-2-117AG of helicopter Mi-8
Purpose	Removal of different modes for concurrent operations of engines TV2-117A in the system for automatic keeping the rotational speed of the free turbine
Fuels used	T-1, TC-1, PT
Maximum fuel pressure at the inlet	60 kgf/cm^2
Working fluid temperature at the inlet	From –50°C to +60°C
Dry weight	1.5 kg

FUEL-OIL UNIT 4030, 4030A

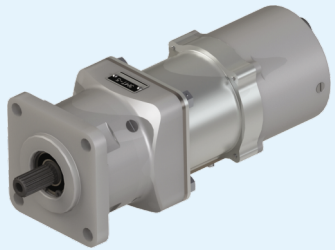
Object of application	Engines GTDE-117-1 of the MIG-29, Su-27, Su -30 aircrafts and their modifications
Purpose	Oil feed to gas-turbine engine of power plant GTDE-117, pumping oil from bearing cavities fuel delivery into engine for its start and fuel governing for the GTDE-117 operation in the "power plant" mode
Working fluid	Fuels PT, TC-1, Oils for 4030 - ИМП-10, 36/1, КУ-А, Oils for 4030A - ВНИИ НП 50-1-4У, ВНИИ НП 50-1-4Ф
Fuel temperature at the unit inlet	From -50°C to +60°C
Oil temperature at the unit inlet	From -0°C to +60°C
Restriction of maximum fuel flow rate	65±2 kg/hr
Restriction of minimum fuel flow rate	30±2 kg/hr
Rotational speed for signal generation to switch off electric starter	7890±560 rpm
Inlet fuel pressure	0.8 -1.6 kg/cm^2
Inlet oil pressure	0±0.1kg/cm^2
Oil pressure at the pump-in stage outlet of the oil pump with oil flow rate of 4.7±0,3 l/min	3±0,5 kg/cm^2
Capacity of pumping out (scavenging) stages of the oil pump: **- first stage** **- second stage**	 900 l/hr 480 l/hr
Direct current consumed by each electromagnet at voltage of 27 V	Not more than 0.5 A
Unit drive **- from turbo-compressor** **- from free turbine**	 floating springer stiff (rigid) shaft
Weight of drive	5.0 kg

SOLENOID BRAKE 72.00.5746.100.000

Object of application	AN-72, AN-74, AN-148, AN-158, AN-168 and their modifications
Purpose	Locking slats and flaps during their asymmetric extension
Brake principle of action	Electromechanical
Brake drive control	Electric remote control
Number of control channels	1 braking action 1 brake release
Torque of drive shaft locking H (kgf)	7 N*m (0.7 kgf*m)
Working voltage of DC power supply	27± 2.7 V
Minimal voltage for braking off	18 V
Consumption current	Not more than 1.2 A
Operation temperature range	From -60°C to +60°C
Unit weight	1.3 kg

SOLENOID BRAKE ЭМТ-1

Object of application	AN-178
Purpose	Transmission braking action and locking of control surfaces in accordance with control signal of protection system from asymmetry
Brake principle of action	Electromechanical control
Brake drive control	Electric remote control
Number of control channel	2 braking action 1 brake release
Torque of drive shaft locking	10 N*m (1kgf *m)
Working voltage range of DC power supply	16 – 32.5 V
Consumption current	Not more than 1A
Operation temperature range	From -60°C to +60°C
Unit weight	1.8 kg

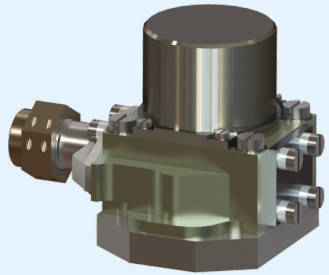


SOLENOID BRAKE ЭМТ-5

Object of application	AN-124 "Ruslan", AN-70
Purpose	Transmission braking action and locking of control surfaces in accordance with control signal of protection system from asymmetry
Brake principle of action	Electromechanical control
Brake drive control	Electric remote control
Number of control channel	2 braking action 1 brake release
Torque of drive shaft locking	60 N*m (6 kgf*m)
Working voltage range of DC power supply	16 – 32.5 V
Consumption current	Not more than 3 A
Operation temperature range	From -60°C to +60°C
Unit weight	Not more than 6.5 kg

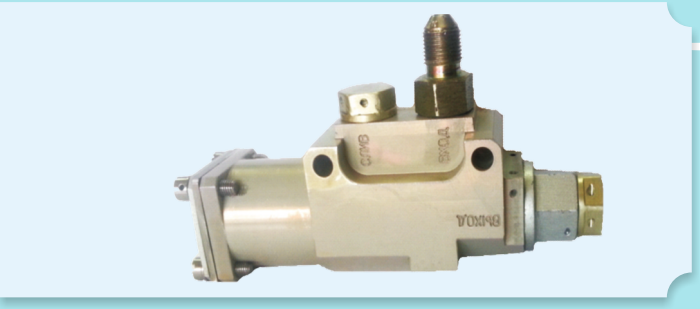
HYDRAULIC MOTOR ГМ44А

Object of application	Yak-40
Purpose	Drive of mechanisms with continuous variable speed from a minimum to a maximum value in both directions of the rotational shaft
	Mechanisms drive for flap deployment/retraction , mechanisms for stabilizer transfer
Working fluid	АМГ-10
Ambient operation temperature range	From -60°C to +60°C
Working fluid operation temperature range	From -60°C to +90°C
Nominal rotational speed	4000 rpm
Working pressure	Max – 180 kgf/cm^2 nom - 150 kgf/cm^2
Specific consumption	2.1 cm^3/rpm
Pressure at tank adapter	7 - 10 kgf/cm^2
Torque on the hydraulic motor shaft (at differential pressure of 140 kgf/cm^2)	33 kgf*cm
Back-pressure in the drain line	Not more than 10kgf/cm^2
Dry weight	Not more than 3.3 kg



ELECTROHYDRAULIC AMPLIFIER (ЭГУ-Д)

Object of application	Steering units for air-crafts and helicopters
Purpose	Fluid consumption formation in proportion to electrical control signals
Working fluid	НГЖ-5У
Ambient operation temperature range	From -55°C to +90°C
Working fluid temperature range **operating** **limiting**	 From -20°C to +80°C From -55°C to +90°C
Working fluid pressure in head pressure line **nominal** **minimum** **maximum**	 210 kgf/cm² 160 kgf/cm² 280 kgf/cm²
Working fluid pressure in drain line **nominal** **minimum** **maximum**	 1.0 kgf/cm² 0.2 kgf/cm² 3.0 kgf/cm²
Number of control windings	2
Resistance of control windings	30 Ohm
Rated control current	±36 mA
Working fluid consumption at the rated control current	14 – 15 l/min
Zero shift, compensated by the positive control signal	8.7 mA
Working fluid purity, grade as to GOST 17216-2001	8
Dry weight	Not more than 0.47 kg

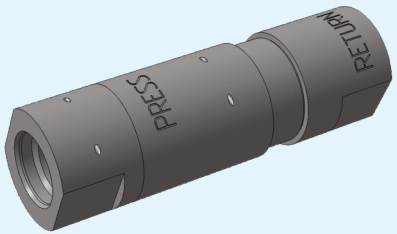


PRESSURE REDUCER VALVE KP-226

Object of application	Ka-226
Purpose	Pressure change in brake hydro-cylinders of aircraft wheels in proportion to operating rod stroke
Working fluid	АМГ-10
Ambient operation temperature range	From -50°C to +70°C
Working fluid operation temperature range	From -50°C to +90°C
Inlet pressure kgf/cm², not more	Not more than 90 kgf/cm²
Outlet pressure from drain pressure	30 kgf/cm²
Rod stroke **idle** **at pressure of 30 kgf/cm²** **full**	mm not more than: 1.2 mm 7.7 mm 11.0 mm
Drain pressure	0.5 - 3.0 kgf/cm²
Rod force for rod stroke of 7.7 mm	30±11 kgf
Dry weight	Not more than 0.4 kg

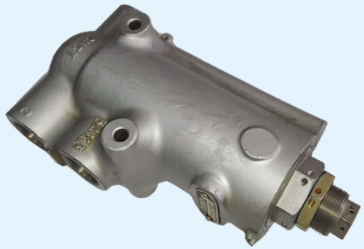
PRESSURE REDUCER VALVE 816.092.000

Object of application	AN-148, AN-158, AN-178, AN-132, AN-70
Purpose	Hydraulic power of the aircraft hydraulic system parts working at reduced pressure from the system with higher pressure
Working fluid	АМГ-10 (modification 816.092.000-2) НГЖ-5У (modification 816.092.000-1Н)
Ambient operation temperature range	From -60°C to +85°C
Working fluid operation temperature range	From -55°C to +100°C
Nominal pressure of pump-in line	210 kgf/cm^2
Reduced pressure	50 – 180 kgf/cm^2
Pressure in drain line	Not more than 30 kgf/cm^2
Working fluid consumption through the valve	From 0.1 to 20 l/min
Working fluid purity, grade as to GOST 17216-2001	12
Dry weight	Not more than 0.65 kg



SAFETY RELIEF VALVE 816.089.000

Object of application	AN-148-100, -200, AN-158, AN-178, AN-132 AN-70
Purpose	Prevention of system against working fluid pressure increase, exceeding permitted value
Working fluid	АМГ-10 (modification 816.089.000-2, 816.089.000-4) НГЖ-5У (modification 816.089.000-1Н, 816.089.000-3Н)
Ambient operation temperature range	From -60°C to +85°C
Working fluid operation temperature range	From -55°C to +100°C
Nominal pressure **modifications 816.089.000-1Н, 816.089.000-2** **modifications 816.089.000-3Н, 816.089.000-4**	 210 kgf/cm² 150 kgf/cm²
Max. working pressure **modifications 816.089.000-1Н, 816.089.000-2** **modifications 816.089.000-3Н, 816.089.000-4**	 220 kgf/cm² 160 kgf/cm²
Max. pressure determined by valve setting **modifications 816.089.000-1Н, 816.089.000-2** **modifications 816.089.000-3Н, 816.089.000-4**	 280 kgf/cm² 210 kgf/cm²
Closing pressure **modifications 816.089.000-1Н, 816.089.000-2** **modifications 816.089.000-3Н, 816.089.000-4**	 230 kgf/cm² 165 kgf/cm²
Working fluid consumption through the valve	40 l/min
Working fluid purity, grade as to GOST 17216-2001	12
Dry weight	Not more than 0.2 kg



SAFETY RELIEF VALVE 816.090.000

Object of application	AN-70 and other AN- aircrafts
Purpose	Prevention of system against working fluid pressure increase, exceeding permitted value
Working fluid	АМГ-10 (modification 816.090.000-2) НГЖ-5У (modification 816.090.000-1Н)
Ambient operation temperature range	From -60°C to +85°C
Working fluid operation temperature range	From -55°C to +100°C
Nominal pressure	210 kgf/cm²
Max. working pressure	220 kgf/cm²
Max. pressure is determined by valve setting	290 kgf/cm²
Closing pressure	230 kgf/cm²
Working fluid consumption through the valve	100 l/min
Working fluid purity, grade as to GOST 17216-2001	12
Dry weight	Not more than 1.0 kg

Public Joint Stock Company
"Volchansk aggregate plant»

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