# 2 Cabinets, control boards, automatic switches

# Cabinets, control boards, automatic switches

## Explosion-proof control boards, cabinets

SHGA/SHGVA/SHGE Control cabinet as per customer's circuit

p. 33

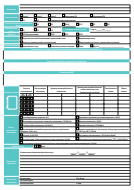
Equipment selection form

p. 37

SHGV...SVET (CCFE-X-SVET) Lighting boards

p. 38

Equipment selection form



p. 42

UVR High-power and high-voltage boards

p. 43

SHGV...-AVR (CCFE-R) type Boards with automatic load transfer

p. 45

## Electric power supplies, accumulator benches

SHGV-IBP (SA-BUFIP) accumulator power supplies

p. 47

VIP-AKB (SA-AKB) Explosion-proof accumulator benches

p. 49

VIP-AIP (CS-EXPL/X-AVTOIP) accumulator power supplies

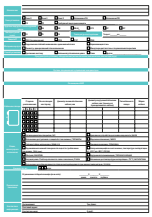
p. 51

## Starting switches

SHGV-PYSK (CCFE-X-PYSK) Lighting distribution board

p. 52

Equipment selection form



p. 59

SHGV...-YPP (CCFE-SOFTSTAR) Explosion-proof inverters

p. 60

## Automatic switches

SHGVA-VA,SHGVA-DVA,SHGVA-UZO (CCA-AVT, CCA-DIFAVT, CCA-UZO)

p. 63

SHGVA-VRP (CCA-VRP) SHGV-VRP (CCFE-VRP)

p. 67

## Accessories

Explosion-proof enclosures

p. 313

Control and indication elements

p. 345

Cable glands Plugs Adapters

p. 365

• A full cycle of production, from casting of die mould up to the finished product.
• Design and engineering of products of various difficulty levels according to the individual schemes of the customer.
• Computer design technology using an electrical circuit and a three-dimensional model.
• Ergonomic design and a wide range of control, indication and alert elements, the model execution and performance on demand of the customer.
• Test of products on the impact of electrical, mechanical and climatic factors.

### MARKING

1Ex d IIC T6...T5 Gb
1Ex d IIC T6...T4 Gb X
1Ex d IIB+$H_2$ T6...T5 Gb
1Ex d [ia] IIB+$H_2$ T6...T5 Gb
1Ex d [ib] IIB+$H_2$ T6...T5 Gb
1Ex d s IIB+$H_2$ T6...T5 Gb
1Ex d e IIC T6...T4 Gb
1Ex d [ia] IIC T6...T4 Gb X
1Ex d [ib] IIC T6...T4 Gb X
Ex tb IIIC T70°C ...T135°C Db

### MINING EQUIPMENT MARKING

RV Ex d I Mb
RV Ex d [ib] Mb
RN1, RN2

### CERTIFICATES AND PERMITS

GOST ISO 9001-2015 (ISO 9001:2015)
TC RU C-RU.AA87.B.00244
TC RU C-RU.МЛ02.B.00620
РОСС RU.МШ06.Н00147
Permit of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia No. PPC 00-044017
PJSC "GAZPROM" No. Г000.RU.1131.H00666
Register of shipping Certificate of Type Approval No. 16.03666.315
Register of shipping Certificate of Type Approval No. 16.03667.315
Specifications (TU) 3400-005-72453807-07

### NORMS

GOST 14254-96 (IEC 529-89)
GOST 12.2.007.0-75
GOST R IEC 60079-0-2011, GOST R IEC 60079-18-2012
GOST IEC 60079-1-2011
GOST 30852.8-2002, GOST 30852.20-2002
GOST 30852.10-2002 (IEC 60079-11:1999)
GOST P 22782.3-77, GOST 24754-2013
Safety Regulations 05-618-03
Safety Regulations 03-553-03
GOST IEC 61241-1-1-2011,
Ch. 7.3 of Electrical Installation Code
Regulatory Document 5.2-093-2004
TR CU 012/2011, TR CU 004/2011, TR CU 020/2011

### TECHNICAL CHARACTERISTICS

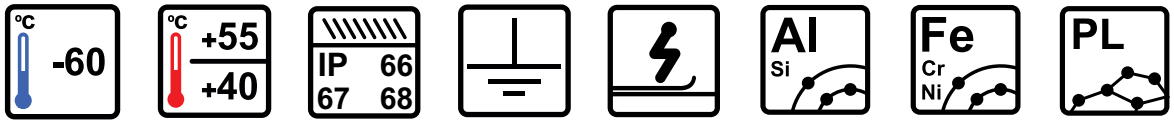
| Installation |
|---|
| Class I, mine gas and dust;<br>Class II, subgroups of gas IIA, IIB+$H_2$, IIC (exept acetylene), IIC; zones 1, 2;<br>Class III (dust), explosive dust atmospheres, containing volatile particles, non-conductive and conductive dust;<br>Underground mines, non-hazardous with gas (methane) and coal dust;<br>Facilities supervised by the Russian Maritime Register of Shipping<br>Hazardous production facilities |

| Nominal voltage, V |
|---|
| 10 000<br>~1000 / ⎓250 |

| Maximal electric current intensity, A |
|---|
| 650; 1500 (for ~1000 / ⎓250) |

| Climatic category |
|---|
| NF1 (on request NF2, NF3, NF4, NF5, F1, F2, F3, F5, T1, T2, T3, T5, MU1, MU2, MU3, MU4, W2.1з**, W5) |

| Chemical resistant version |
|---|
| On request C1, C2, C3 |



# Control boards according to customer's layout SHGV/SHGVA/SHGE

**OPTIONS, ACCESSORISES AND VERSIONS**

| DESCRIPTION | MARKING |
|---|---|
| Anti-condensation cover | /AP |
| Drainage device for condensate draining | /DKUV |
| Version for the tropics with protection against insects | /TERMITI |
| Climatic category MU1 | /MORE |
| Earthquake-resistant version | /MSK-64 |
| Customer acceptance | /PRIEMKA |
| Painting of external surface using the colour required by customer (on request) | /RAL (code) |

| DESCRIPTION | MARKING |
|---|---|
| Internal thermal insulation | /TEPLOIZOLYATSIYA |
| Heating | /OBOGREV |
| Non-explosion-proof perfor-mance, operating temperature since -60C up to +80C | /PROM |
| Supporting frame. The bracket for mounting is on the customer's layout | /RAMA |
| Version for equipment constantly operated at low temperatures | /HOLOD |

According to technical design specification or sketch drawings of the customer, we design and manufacture explosion-proof all-weather general purpose industrial version cabinets and boards of standard model performance or not typical of non standard performance of different difficulty levels:

- Main distribution board (GRSHCH)
- Incoming switchgear (VRU)
- Emergency reserve input (AVR)
- Lighting board (OSHCH)
- Lighting board (OSHCHV)
- Street lighting control board (SHCHUO)
- Control board (SHCH)
- Pump control board (SHCHUN)
- Fan contro (SHCHUV)
- Automatic switchboard (SHCHA)
- Uninterrupted power supply board (SHCHBP)
- Electric power meltering board (SHCHU)
- Control station board (SHCHSU)
- Distribution board (RSHCH)
- Distributing power supply cabinets (SHRS)
- Distributing removable board (RPSHCH)
- Main grounding bus board (GZSH)
- Bus-type board (SHCHSH)
- DC board (SHCHPT)
- Average voltage board
- Operating system board (SHCHSU)
- Control stations board (SHCHSU)
- Gate valves operation board (SHCHUZ)
- Board with mounting plate (SHCHMA)
- Control station aggregate board (ASHCHSU)
- Pilot controller board (SHCK)
- Controller's cabinet (SHK)
- Engine control cabinet (SHUD)
- Filter control cabinet (SHUF)
- Pumping module control cabinet (SHUNA)
- High-voltage pump control cabinets (SHUVN)
- Oil pump control cabinet (SHUN, MNU)
- Air-blast control cabinet (SHUV)
- Automatic standby activation cabinet (AVR)
- Relay protection and automatic equipment telemetry cabinet (RZA)
- Cabinets for automatic start of reserve power (SHAVR)
- Technologic commutation switch cabinet (TKU)
- Central commutation switch cabinet (CKU)
- Shutoff and control valves control cabinet (SHUZRA)
- Elevator management cabinet (SHUL)
- Control cabinet (SHU)
- Control cabinet with frequency inverter PCH
- Soft start control cabinet (UPP)
- Direct start control cabinet (PP)
- Automation cabinet (SHA)
- Automation and control cabinet (SHAU)
- Control and signaling cabinet (SHUS)
- Electric drive and servo drive control cabinet
- Automation cabinet (SHA)
- Teleautomatics cabinet (TM)
- Telemetry cabinet (SHTI)
- Control cabinet (ASU TP)
- Communicational cabinet (SHK)
- Network cabinet (SHS)
- Communications cabinet (VCH)
- Central equipment cabinet (SHCO)
- Tele-commutation cabinet (SHTK)
- Emergency messages register cabinet (RAS)
- Obstruction light automation control cabinet (KZOS)
- Cabinet of non-control circuits (SHNC)
- Dimmer cabinet
- Electrical heating control cabinet (SHUE)
- Cross functional instrumental board (SHPU)
- Ovenized cabinet
- Low voltage complete device manufactured by standard and individual projects
- Control and instrumentation cabinet on individual schemes
- Semi-finished products for **OEM products**

| | |
|---|---|
| Explosion-proof enclosures | See p. 313 |
| Control and indication elements | See p. 345 |
| Recommended cable glands KNV, KOV, KNVTN, KNVTV, KNVM, KNVZ | See p. 365 |

## EQUIPMENT SELECTION FORM FOR SHGV, SHGVA, SHGE, UVG (QFM), CONTROL CABINETS ON CUSTOMER'S SCHEMES

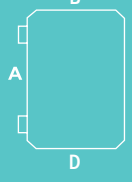
| | | | | | | |
|---|---|---|---|---|---|---|
| Purpose | | | | | | |
| Installation zones | ☐ Zone 0 | ☐ Zone 1 | ☐ Zone 2 | ☐ RN version | ☐ RV version | |
| | ☐ RO version | ☐ RP version | ☐ The required type of Ex protection _____ | | | |
| Group and subgroup of gas-air mixture | ☐ IIA | ☐ IIB | ☐ IIB+$H_2$ | ☐ IIC X | ☐ IIC | ☐ IIIC |
| Temperature class | ☐ T4 | ☐ T5 | ☐ T6 | Operating temperature | $T_{ambient}$ from _____ to _____ | |
| IP protection | ☐ IP66 (on default) | ☐ IP67 | ☐ IP68 | | | |
| Material of enclosure | ☐ Corrosion-resistant aluminum-silicon alloy | | ☐ Stainless steel | | | |
| | ☐ Polyester glass reinforced by fiber | | ☐ Powder Coated Low Carbon Steel | | | |
| Installation method | ☐ Wall mounting | ☐ Ground-type installation on the frame | | ☐ Frame | ☐ Other _____ | |

**To provide for the installation of equipment (circuit breakers, contactors, etc.)**

**Bodies of operational controls and indicators**

**Placing of control and administrations**

**Cable glands**




| Side of positioning | | | | Quantity of cables for 1 side | The diameter of the outer shell of the cable | | The diameter of the inner shell of the cable (only for armored cable) | | Type of cable glad | Mark of a cable |
|---|---|---|---|---|---|---|---|---|---|---|
| A | B | C | D | | | | | | | |
| ☐ | ☐ | ☐ | ☐ | | | | | | | |
| ☐ | ☐ | ☐ | ☐ | | | | | | | |
| ☐ | ☐ | ☐ | ☐ | | | | | | | |
| ☐ | ☐ | ☐ | ☐ | | | | | | | |
| ☐ | ☐ | ☐ | ☐ | | | | | | | |

**Options, accessorises and versions**

| | |
|---|---|
| ☐ Anti-condensation cover /AP | ☐ The drainage device for draining of condensate/DKUV |
| ☐ Version for the tropics with protection against insects/TERMITI | ☐ Climat category MU/MORE |
| ☐ Earthquake-resistant version /MSK-64 | ☐ Customer's acceptance /PRIEMKA |
| ☐ Painting of external surface using the colour required by customer (on request) /RAL | ☐ Non-explosion-proof version, operating temp. since –60°C up to +80°C /PROM |
| ☐ Electrical heating /OBOGREV | ☐ Internal thermal insulation/TEPLOIZOLYACIYA |
| ☐ Installation on the frame /RAMA | ☐ Version for min. operating temperature –75°C /HOLOD |

| | |
|---|---|
| Quantity, pcs | ☐☐☐ pcs |

**Customer's notes**

Limiting of dimensions of cabinet (if there are): _____X_____X_____
length height depth

| | |
|---|---|
| Organization: | Tel./fax: |
| Post address : | |
| Contact person: | E-mail: |

# SHGV-SVET CCFE-X-SVET

IIC

• SHGV-SVET lighting boards intended for the distribution of the AC voltage of 380 V, 50/60 Hz, and DC voltage of 220 V in stationary lighting networks and their protection in hazardous areas of companies.
• High resistance aluminum alloy enclosures to the effects of hydrogen sulfide.
• The possibility of sealing of lighting boards control handles.

### MARKING

Ex 1Ex d IIC T6...T5 Gb X
Ex 1Ex d IIB+$H_2$ T6...T5 Gb
Ex Ex tb IIIC T70°C...T100°C Db

### MINING EQUIPMENT MARKING

Ex RV Ex d I Mb
RN2

### CERTIFICATES AND PERMITS

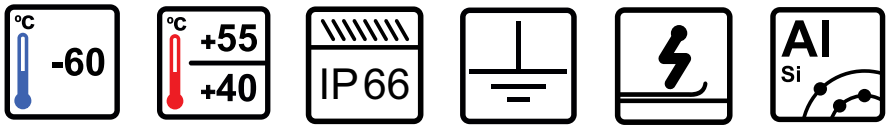
GOST ISO 9001-2015 (ISO 9001:2015)
TC RU C-RU.AA87.B.00244
TC RU C-RU.МЛ02.B.00620
РОСС RU.МШ06.Н00147
Permit of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia No. PPC 00-044017
Register of shipping Certificate of Type Approval No. 16.03666.315
Register of shipping Certificate of Type Approval No. 16.03667.315
Specifications (TU) 3400-005-72453807-07
PJSC “GAZPROM” No. Г000.RU.1131.Н00666

### NORMS

GOST 14254-96 (IEC 529-89)
GOST R IEC 60079-0-2011
GOST IEC 60079-1-2011
GOST IEC 61241-1-1-2011
Ch. 7.3 of Electrical Installation Code
Ch. 7.4 of Electrical Installation Code
Regulatory document 5.2-093-2004
GOST 30852.20-2002
Safety regulations 05-618-03
Safety regulations 03-553-03
GOST 24754-2013
GOST 12.2.007.0-75
TR CU 020/2011, TR CU 004/201

### TECHNICAL CHARACTERISTICS

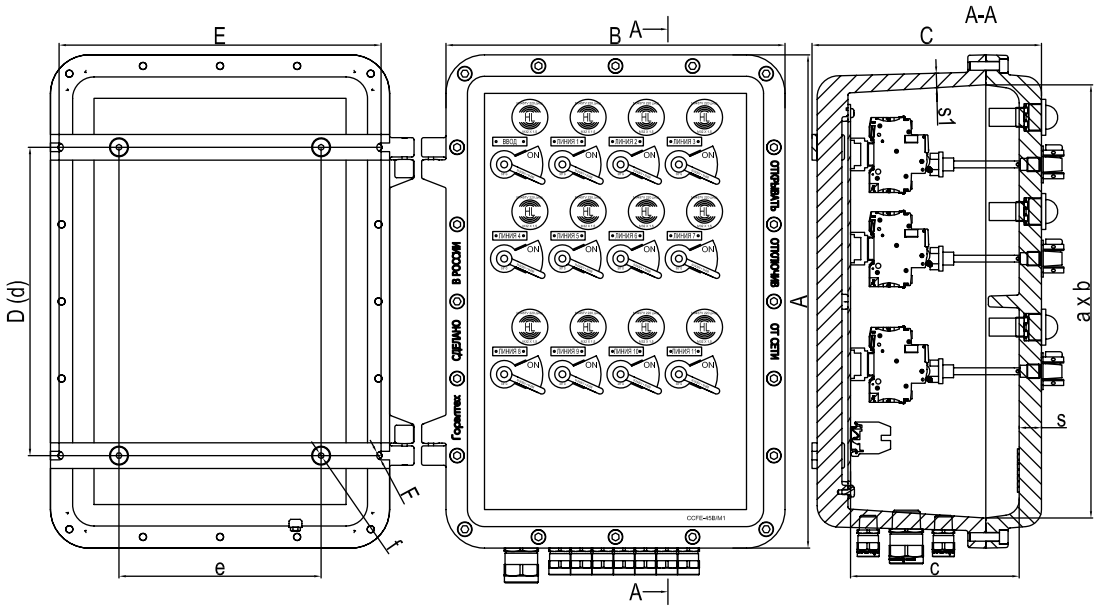
| | |
|---|---|
| **Installation** | Class I, mine gas and dust;<br>Class II, subgroups of gas IIA, IIB+$H_2$, IIC (exept acetylene), zones 1, 2;<br>Class III (dust), explosive dust atmospheres, containing volatile particles, non-conductive and conductive dust;<br>Underground mines, non-hazardous with gas (methane) and coal dust;<br>Facilities supervised by the Russian Maritime Register of Shipping<br>Hazardous production facilities |
| **Nominal voltage, V** | ~380 / ⎓220 |
| **Maximal electric current intensity, A** | 650 |
| **Options** | Valve for drainage and condensate drain |
| **Electrical endurance, cycles** | 20 000 |
| **Climatic category** | NF1 (on request NF2, NF3, NF4, NF5, F1, F2, F3, F5, T1, T2, T3, T5, MU1, MU2, MU3, MU4, W2.13**, W5) |
| **Chemical resistant version** | On request C1, C2, C3 |



## OPTIONS, ACCESSORISES AND VERSIONS

| DESCRIPTION | MARKING |
|---|---|
| Anti-condensation cover | /AP |
| Drainage device for condensate draining | /DKUV |
| Version for the tropics with protection against insects | /TERMITI |
| Earthquake-resistant version | /MSK-64 |
| Customer acceptance | /PRIEMKA |
| Painting of external surface using the colour required by customer (on request) | /RAL (code) |
| Enclosure material is highly corrosion-resistant chromium-nickel stainless casting steel | /H |
| Internal thermal insulation | /TEPLOIZOLYATSIYA |
| Heating | /OBOGREV |
| Light remote sensor of dusky relay | /DS |
| Bearing frame. Supporting bracket is according customer's layout | /RAMA |

## OVERALL AND MOUNTING DIMENSIONS




*For mining explosion-proof version input miner terminal boxes with type of protection Exd are used.*

***Overall dimensions of enclosures used for SHGV-...-SVET lighting boards***

| Typical sizes of enclosures | Sizes, mm | | | | | | | | | | | | | | Max.quantity of A.S.C.L.*,pcs | Quantity of A.S. without C.L.**,pcs | Weight, kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | External | | | Internal | | | | | Standard mounting | | | Mountig by brackets | | | | | |
| | A | B | C | a | b | c | S | S1 | d | e | f | D | E | F | | | |
| SHGV302021-SVET | 304 | 204 | 211 | 240 | 140 | 163 | 14 | 14 | 230 | 130 | M8 | 230 | 210 | 9 | 1 | 5 | 8,8 |
| SHGV422221-SVET | 424 | 224 | 213 | 359 | 159 | 165 | 15 | 14 | 350 | 150 | M8 | 350 | 230 | 9 | 6 | 18 | 13,6 |
| SHGV362827-SVET | 364 | 284 | 275 | 300 | 220 | 217 | 20 | 14 | 290 | 210 | M8 | 290 | 290 | 9 | 4 | 18 | 17,25 |
| SHGV362821-SVET | 364 | 284 | 215 | 300 | 220 | 157 | 20 | 14 | 290 | 210 | M8 | 290 | 290 | 9 | 4 | 18 | 14,29 |
| SHGV423229-SVET | 425 | 325 | 297 | 361 | 261 | 233 | 24 | 14 | 350 | 250 | M10 | 350 | 330 | 11 | 6 | 22 | 25,3 |
| SHGV423222-SVET | 425 | 325 | 226 | 361 | 261 | 163 | 24 | 14 | 350 | 350 | M10 | 350 | 330 | 11 | 6 | 22 | 20,7 |
| SHGV573931-SVET | 576 | 396 | 318 | 506 | 329 | 247 | 26 | 20 | 360 | 236 | M10 | 360 | 376 | 11 | 11 | 33 | 48,1 |
| SHGV573926-SVET | 576 | 396 | 268 | 506 | 326 | 197 | 26 | 20 | 360 | 236 | M10 | 360 | 376 | 11 | 11 | 33 | 44,4 |
| SHGV654533-SVET | 650 | 450 | 337 | 570 | 370 | 222 | 16 | 17,5 | 550 | 350 | M10 | 550 | 446 | 11 | 12 | 42 | 59,5 |
| SHGV654526-SVET | 650 | 450 | 265 | 570 | 370 | 150 | 16 | 16 | 550 | 350 | M10 | 550 | 446 | 11 | 12 | 42 | 51,6 |
| SHGV725235-SVET | 723 | 523 | 359 | 639 | 439 | 246 | 23 | 18,5 | 600 | 400 | M10 | 600 | 505 | 11 | 20 | 63 | 83,8 |
| SHGV725224-SVET | 723 | 523 | 249 | 639 | 439 | 136 | 23 | 17 | 600 | 400 | M10 | 600 | 505 | 11 | 20 | 63 | 71,2 |
| SHGV896745-SVET | 891 | 671 | 455 | 556 | 776 | 374 | 23 | 29 | 680 | 480 | M16 | 680 | 640 | 14 | 42 | 168 | 173,9 |
| SHGV896735-SVET | 891 | 671 | 355 | 556 | 776 | 274 | 23 | 28 | 680 | 480 | M16 | 680 | 640 | 14 | 42 | 168 | 150 |

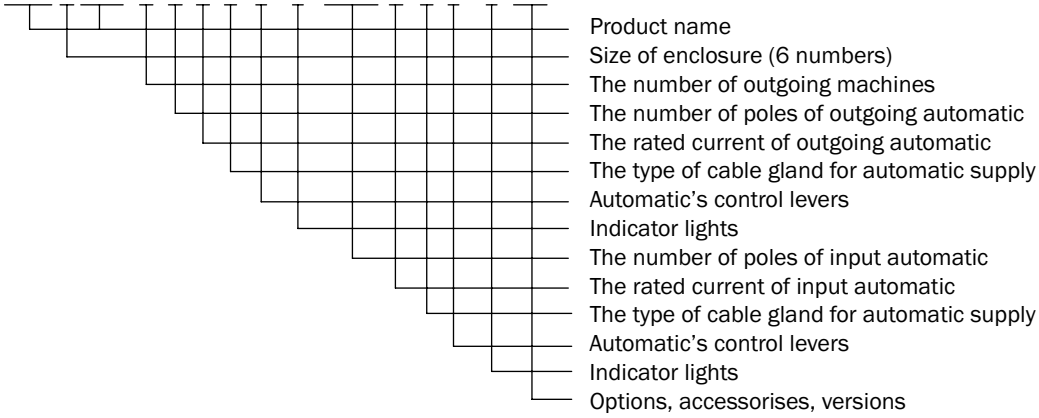
** Max.quantity of automatic switches control levers at the enclosure's cover plate.*

*** Max.quantity of installed one polar automatic switches to a rated current up to 63A without control levers (for 2-polar automatic switches the quantity is divisible by 2, for 3-polar – by 3, etc.).*

| | |
|---|---|
| Control and indication elements | See p. 345 |
| Recommended cable glands KNV, KOV, KNVTN, KNVTV, KNVM, KNVZ | See p. 365 |

**MARKING FORMATION**

**SHGV-X-SVET - X - X - X - X / R / L -... V - X - X - X / R / L / X X – Specifications (TU) 3400-005-72453807-07**




**Order example:** **SHGV362821-SVET-3-1-16-KOV1/R-V-3-63-KOV3/R – Specifications (TU) 3400-005-72453807-07**
Lighting switchboard based on SHGV362822-SVET, equipped with:
– 3 supply feeders 1p.16A with control levers on the enclosure;
– 1 cable glands for armor cable of KOV1-type
– 1 automatic input breaker 3p. 63A with control lever at the enclosure
– 1 cable gland for armor cable of KOV3-type

If you find it difficult to choose the size of the required characteristic, put the letter X instead of figures after the name of the box (SHGV X-SVET).

SHGV-SVET-type lighting switchboard can be equipped with a control twilight switch with integrated or external light detector in the KV-KIP enclosure.

SHGV-SVET-type lighting switchboards can also work in conjunction with the control twilight relay DVG-SVET. Twilight relay sends a command to closure or interruption of the circuit when the lighting threshold detected by photocell is reached.

***Codes matching table***

| Previous international product names of "ZAVOD GORELTEX" CO. Ltd. Specifications (TU) 3400-005-72453807-07 | Customs union code "ZAVOD GORELTEX" CO. Ltd. Specifications (TU) 3400-005-72453807-07 |
|---|---|
| Lighting switchboard | |
| CCFE-X-SVET | SHGV-...-SVET |
| CCFE-1R-SVET | SHGV302021-SVET |
| CCFE-2R-SVET | SHGV422221-SVET |
| CCFE-3R-SVET | SHGV362827-SVET |
| CCFE-3VR-SVET | SHGV362821-SVET |
| CCFE-4R-SVET | SHGV423229-SVET |
| CCFE-4VR-SVET | SHGV423222-SVET |
| CCFE-45-SVET | SHGV573931-SVET |
| CCFE-45V-SVET | SHGV573926-SVET |
| CCFE-5-SVET | SHGV654533-SVET |
| CCFE-5V-SVET | SHGV654526-SVET |
| CCFE-55-SVET | SHGV725235-SVET |
| CCFE-55V-SVET | SHGV725224-SVET |
| CCFE-6-SVET | SHGV896745-SVET |
| CCFE-6V-SVET | SHGV896735-SVET |

*Table of ready typical lighting boards*

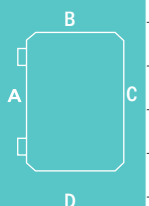
| Operating handle of each automatic switch | Operating handle of incoming circuit breaker only | Quantity of outgoing circuit breakers | Quantity of poles of outgoing circuit breakers | Rated current of outgoing circuit breaker | Quantity of poles of ingoing circuit breaker | Rated current of ingoing circuit breaker |
|---|---|---|---|---|---|---|
| SHGV362821-SVET-3-1-16-KOV1/R-V-KOV3 | SHGV302021-SVET-3-1-16-KOV1-V-KOV3 | 3 | 1 | 16 | – | – |
| SHGV362821-SVET-3-1-16-KOV1/R-V-3-63-KOV3/R | SHGV362821-SVET-3-1-16-KOV1-V-3-63-KOV3/R | 3 | 1 | 16 | 3 | 63 |
| SHGV362821-SVET-3-1-16-KOV1/R-V-3-25-KOV2/R | SHGV362821-SVET-3-1-16-KOV1-V-3-25-KOV2/R | 3 | 1 | 16 | 3 | 25 |
| SHGV573926-SVET-6-1-16-KOV1/R-V-KOV3 | SHGV362821-SVET-6-1-16-KOV1-V-KOV3 | 6 | 1 | 16 | – | – |
| SHGV573926-SVET-6-1-16-KOV1/R-V-3-63-KOV3/R | SHGV362821-SVET-6-1-16-KOV1-V-3-63-KOV3/R | 6 | 1 | 16 | 3 | 63 |
| SHGV573926-SVET-6-1-16-KOV1/R-V-3-63-KOV4/R | SHGV362821-SVET-6-1-16-KOV1-V-3-63-KOV4/R | 6 | 1 | 16 | 3 | 63 |
| SHGV573926-SVET-9-1-16-KOV1/R-V-3-63-KOV3/R | SHGV573926-SVET-9-1-16-KOV1-V-3-63-KOV3/R | 9 | 1 | 16 | 3 | 63 |
| SHGV573926-SVET-9-1-16-KOV1/R-V-3-63-KOV4/R | SHGV573926-SVET-9-1-16-KOV1-V-3-63-KOV4/R | 9 | 1 | 16 | 3 | 63 |
| SHGV654526-SVET-12-1-16-KOV1/R-V-3-63-KOV3/R | SHGV573926-SVET-12-1-16-KOV1-V-3-63-KOV3/R | 12 | 1 | 16 | 3 | 63 |
| SHGV654526-SVET-12-1-16-KOV1/R-V-3-63-KOV4/R | SHGV573926-SVET-12-1-16-KOV1-V-3-63-KOV4/R | 12 | 1 | 16 | 3 | 63 |
| SHGV362821-SVET-1-3-63-KOV1/R-V-KOV3 | SHGV302021-SVET-1-3-63-KOV1-V-KOV3 | 1 | 3 | 63 | – | – |
| SHGV362821-SVET-2-3-25-KOV1/R-V-KOV3 | SHGV362821-SVET-2-3-25-KOV1-V-KOV3 | 2 | 3 | 25 | – | – |
| SHGV573926-SVET-2-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-2-3-25-KOV1-V-3-100-KOV4/R | 2 | 3 | 25 | 3 | 100 |
| SHGV573926-SVET-3-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-3-3-25-KOV1-V-3-100-KOV4/R | 3 | 3 | 25 | 3 | 100 |
| SHGV573926-SVET-3-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-3-3-25-KOV1-V-3-100-KOV4/R | 3 | 3 | 25 | 3 | 100 |
| SHGV573926-SVET-4-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-4-3-25-KOV1-V-3-100-KOV4/R | 4 | 3 | 25 | 3 | 100 |
| SHGV573926-SVET-4-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-4-3-25-KOV1-V-3-100-KOV4/R | 4 | 3 | 25 | 3 | 100 |
| SHGV362821-SVET-3-1-25-KOV1/R-V-KOV3 | SHGV302021-SVET-3-1-25-KOV1-V-KOV3 | 3 | 1 | 25 | – | – |
| SHGV573926-SVET-3-1-25-KOV1/R-V-3-100-KOV4/R | SHGV362821-SVET-3-1-25-KOV1-V-3-100-KOV4/R | 3 | 1 | 25 | 3 | 100 |
| SHGV362821-SVET-3-1-25-1-3-25-KOV1/R-V-KOV3 | SHGV362821-SVET-3-1-25-1-3-25-KOV1-V-KOV3 | 3 | 1 | 25 | – | – |
| | | 1 | 3 | 25 | – | – |
| SHGV573926-SVET-3-1-25-1-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-3-1-25-1-3-25-KOV1-V-3-100-KOV4/R | 3 | 1 | 25 | 3 | 100 |
| | | 1 | 3 | 25 | | |
| SHGV573926-SVET-3-1-25-2-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET3-1-25-2-3-25-KOV1-V-3-100-KOV4/R | 3 | 1 | 25 | 3 | 100 |
| | | 2 | 3 | 25 | | |
| SHGV573926-SVET-3-1-25-2-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-3-1-25-2-3-25-KOV1-V-3-100-KOV4/R | 3 | 1 | 25 | 3 | 100 |
| | | 2 | 3 | 25 | | |
| SHGV573926-SVET-3-1-25-3-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-3-1-25-3-3-25-KOV1-V-3-100-KOV4/R | 3 | 1 | 25 | 3 | 100 |
| | | 3 | 3 | 25 | | |
| SHGV573926-SVET-3-1-25-3-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-3-1-25-3-3-25-KOV1-V-3-100-KOV4/R | 3 | 1 | 25 | 3 | 100 |
| | | 3 | 3 | 25 | | |
| SHGV573926-SVET-6-1-25-KOV1/R-V-KOV3 | SHGV362821-SVET-6-1-25-KOV1-V-KOV3 | 6 | 1 | 25 | – | – |
| SHGV573926-SVET-6-1-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-6-1-25-KOV1-V-3-100-KOV4/R | 6 | 1 | 25 | 3 | 100 |
| SHGV573926-SVET-6-1-25-1-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-6-1-25-1-3-25-KOV1-V-3-100-KOV4/R | 6 | 1 | 25 | 3 | 100 |
| | | 1 | 3 | 25 | | |
| SHGV573926-SVET-6-1-25-1-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-6-1-25-1-3-25-KOV1-V-3-100-KOV4/R | 6 | 1 | 25 | 3 | 100 |
| | | 1 | 3 | 25 | | |
| SHGV654526-SVET-6-1-25-2-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-6-1-25-2-3-25-KOV1-V-3-100-KOV4/R | 6 | 1 | 25 | 3 | 100 |
| | | 2 | 3 | 25 | | |
| SHGV654526-SVET-6-1-25-2-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-6-1-25-2-3-25-KOV1-V-3-100-KOV4/R | 6 | 1 | 25 | 3 | 100 |
| | | 2 | 3 | 25 | | |
| SHGV654526-SVET9-1-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-9-1-25-KOV1-V-3-100-KOV4/R | 9 | 1 | 25 | 3 | 100 |
| SHGV654526-SVET-9-1-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-9-1-25-KOV1-V-3-100-KOV4/R | 9 | 1 | 25 | 3 | 100 |
| SHGV654526-SVET-9-1-25-1-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-9-1-25-1-3-25-KOV1-V-3-100-KOV4/R | 9 | 1 | 25 | 3 | 100 |
| | | 1 | 3 | 25 | | |
| SHGV654526-SVET-9-1-25-1-3-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-9-1-25-1-3-25-KOV1-V-3-100-KOV4/R | 9 | 1 | 25 | 3 | 100 |
| | | 1 | 3 | 25 | | |
| SHGV654526-SVET-12-1-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-12-1-25-KOV1-V-3-100-KOV4/R | 12 | 1 | 25 | 3 | 100 |
| SHGV654526-SVET-12-1-25-KOV1/R-V-3-100-KOV4/R | SHGV573926-SVET-12-1-25-KOV1-V-3-100-KOV4/R | 12 | 1 | 25 | 3 | 100 |

# Equipment Selection Form

## EQUIPMENT SELECTION FORM FOR SHGV-SVET (CCFE-X-SVET) LIGHTING BOARD ON CUSTOMER'S SCHEMES

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Installation zones | ☐ Zone 1 ☐ Zone 2 ☐ RN2 version ☐ RV version | | | | | | | |
| | ☐ The required type of Ex protection ____ | | | | | | | |
| Temperature class | ☐ T5 ☐ T6 | Operating temperature | $T_{ambient}$ from ____ to ____ | | | | | |
| IP protection | ☐ IP66 (by default) | Group and subgroup of gas-air mixture | ☐ IIC X ☐ IIB ☐ IIB+$H_2$ ☐ IIIC | | | | | |
| Material of enclosure | ☐ Corrosion-resistant aluminum-silicon alloy ☐ Corrosion-resistant chromium-nickel stainless steel | | | | | | | |
| Installation method | ☐ Wall mounting ☐ Ground-type installation on the frame ☐ Frame ☐ Other _____ | | | | | | | |
| Characteristics of lighting | Automatic switches | Input | Quantity,pcs | | | | | |
| | | | Quantity of poles,pcs | | | | | |
| | | | Rated current, A | | | | | |
| | | | Operating handle | ☐ | ☐ | ☐ | ☐ | ☐ |
| | | | Lighting indication | ☐ | ☐ | ☐ | ☐ | ☐ |
| | | | Colour of lighting indication | | | | | |
| | | Output | Quantity,pcs | | | | | |
| | | | Quantity of poles, pcs | | | | | |
| | | | Rated current, A | | | | | |
| | | | Operating handle | ☐ | ☐ | ☐ | ☐ | ☐ |
| | | | Lighting indication | ☐ | ☐ | ☐ | ☐ | ☐ |
| | | | Colour of lighting indication | | | | | |
| | Terminals (if required) | Cross-section, $mm^2$/quantity, pcs | | | | | | |
| | | Cross-section, $mm^2$/quantity, pcs | | | | | | |
| | | Cross-section, $mm^2$/quantity, pcs | | | | | | |

| Cable glands | Side of positioning | | | | Quantity of cables for 1 side | The diameter of the outer shell of the cable | The diameter of the inner shell of the cable (only for armored cable) | | Type of cable gland | Mark of a cable |
|---|---|---|---|---|---|---|---|---|---|---|
| | A | B | C | D | | | | | | |
| | ☐ | ☐ | ☐ | ☐ | | | | | | |
| | ☐ | ☐ | ☐ | ☐ | | | | | | |
| | ☐ | ☐ | ☐ | ☐ | | | | | | |
| | ☐ | ☐ | ☐ | ☐ | | | | | | |
| | ☐ | ☐ | ☐ | ☐ | | | | | | |
| | ☐ | ☐ | ☐ | ☐ | | | | | | |
| | ☐ | ☐ | ☐ | ☐ | | | | | | |
| | ☐ | ☐ | ☐ | ☐ | | | | | | |




| | | |
|---|---|---|
| Options, accessorises and versions | ☐ Anti-condensation cover /AP | ☐ Customer's acceptance /PRIEMKA |
| | ☐ The drainage device for draining of condensate/DKUV | ☐ Internal thermal insulation/TEPLOIZOLYACIYA |
| | ☐ Version for the tropics with protection against insects/TERMITI | ☐ Electrical heating /OBOGREV |
| | ☐ Earthquake-resistant version /MSK-64 | ☐ Twilight light switch remote sensor /DS |
| | ☐ Painting of external surface using the colour required by customer (on request)/RAL | |
| Quantity, pcs | ☐☐☐ pcs | |
| Customer's notes | Limiting of dimensions of cabinet (if there are): _____X_____X_____ length height depth | |
| | | |
| | | |
| Contact information | Organization: | Tel/fax: |
| | Post address: | |
| | Contact person: | E-mail: |

• Flame proof joint products service life is more than 25 years.
• High resistance of SHORV enclosures made of aluminum alloy to hydrogen sulfide's exposure.
• Claddings are designed and tested in up to –60 °C temperature conditions.
• Unpainted interior surface of the enclosure provides extra heat conduction.
• Possibility of producing of the enclosure with a window (rectangular or round).
• UVR power high-voltage boards designed for commutation of high voltage current in the stationary electrical lines
• Ability to connect the heavy cable.

IIC

**MARKING**

Ex 1Ex d IIC T6...T4 Gb X
Ex 1Ex d IIB+$H_2$ T6...T4 Gb
Ex Ex tb IIIC T85°C...T135°C Db

**MINING EQUIPMENT MARKING**

RN1, RN2

**CERTIFICATES AND PERMITS**

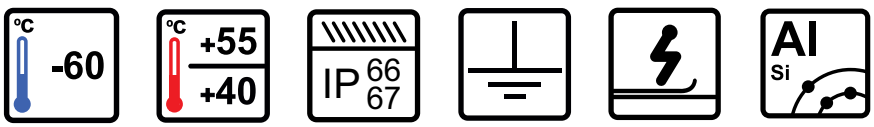
GOST ISO 9001-2015 (ISO 9001:2015)
TC RU C-RU.AA87.B.00244
РОСС RU.МШ06.Н00147
Permit of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia No. PPC 00-044017
Specifications (TU) 3400-005-72453807-07

**NORMS**

GOST 14254-96 (IEC 529-89)
GOST R IEC 60079-0-2011
GOST IEC 60079-1-2011
TR CU 012/2011
GOST IEC 61241-1-1-2011
GOST 30852.20-2002
GOST 24754-2013
GOST 12.2.007.0-75
Ch. 7.3 of Electrical Installation Code
Ch. 7.4 of Electrical Installation Code
Regulatory document 5.2-093-2004

**TECHNICAL CHARACTERISTICS**

| | |
|---|---|
| **Installation** | Class II, subgroups of gas IIA, IIB+$H_2$, IIC (exept acetylene), Zones 1, 2; Class III (dust), explosive dust atmospheres, containing volatile particles, non-conductive and conductive dust; Underground mines, non-hazardous with gas (methane) and coal dust; Hazardous production facilities |
| **Maximal voltage, V** | ~10000, 3300 |
| **Maximal electric current intensity, A** | Up to 600 |
| **Cover** | Antistatic epoxy-polymer colouring, frictionally intrinsically safe, resistant to operating environments ionization radiation. RAL 7035 colour |
| **Climatic category** | NF1 (on request NF2, NF3, NF4, NF5, F1, F2, F3, F5, T1, T2, T3, T5, MU1, MU2, MU3, MU4, W2.13**, W5) |
| **Chemical resistant version** | On request C1, C2, C3 |

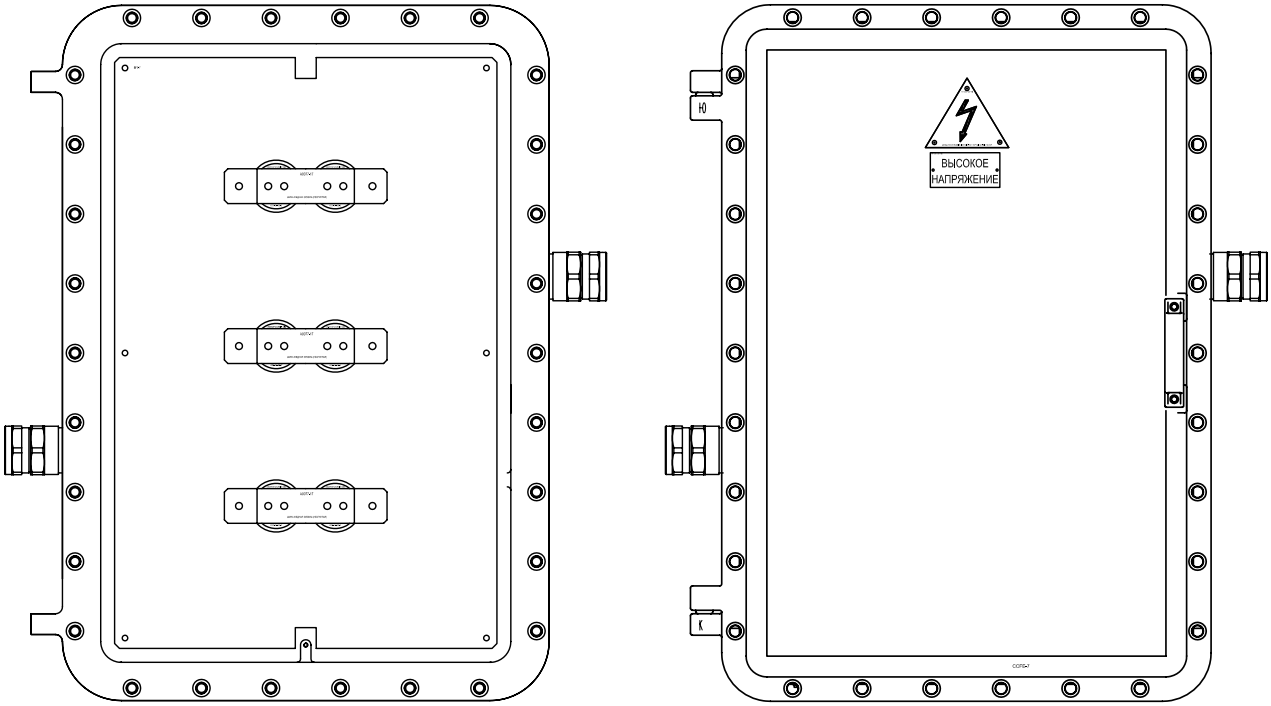


# Powered high-voltage boards UVR CCFE

**OPTIONS, ACCESSORISES AND VERSIONS**

| DESCRIPTION | MARKING |
|---|---|
| Anti-condensation cover | /AP |
| Drainage device for condensate draining | /DKUV |
| Version for the tropics with protection against insects | /TERMITI |
| Earthquake-resistant version | /MSK-64 |
| Customer acceptance | /PRIEMKA |
| Painting of external surface using the colour required by customer (on request) | /RAL (code) |
| Internal thermal insulation | /TEPLOIZOLYATSIYA |
| Heating | /OBOGREV |
| Insulated neutral | /NEITRAL |
| Bearing frame. Supporting bracket is according customer's layout | /RAMA |

**BOARD OUTER APPEARENCE**




*Note: High-voltage boards are made according to all requirements and wishes of the customer.*

Recommended cable glands
KNV, KOV, KNVTN, KNVTV, KNE, KNVZ
See p. 365

• Number of feeders and their characteristics (number of phases, electric current intensity) is determined in accordance with customer requirements. One module (based on SHORV896745 enclosure) can contain up to 27 feeders, and thus the minimum completing unit is one input module (with AVR) and two output modules (with feeder). With an increase of cabinet for one module with feeders the width is increased for 730 mm plus.

• On explosion board AVR remote control can be installed to outgoing SHGV-AVR lines (installation of contactors or gearmotors).

IIC

### MARKING

1Ex d IIC T6...T5 Gb X
1Ex d IIB+$H_2$ T6...T5 Gb
1Ex d e IIB T6...T5 Gb
Ex tb IIIC T70°C...T100°C Db

### MINING EQUIPMENT MARKING

RV Ex d I Mb
RN2

### CERTIFICATES AND PERMITS

GOST R ISO 9001-2015 (ISO 9001:2015)
TC RU C-RU.AA87.B.00244
РОСС RU.МШ06.Н00147
Permit of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia No. PPC 00-044017
Register of shipping Certificate of Type Approval No. 12.02065.315
Specifications (TU) 3400-005-72453807-07
PJSC "GAZPROM" No. Г000.RU.1131.Н00666

### NORMS

GOST 30852.20-2002
GOST R IEC 60079-0-2011
GOST IEC 60079-1-2011
GOST 30852.8-2002
GOST 14254-96 (IEC 529-89)
TR CU 012/2011
GOST IEC 61241-1-1-2011
GOST 12.2.007.0-75
Ch. 7.3 of Electrical Installation Code
Ch. 7.4 of Electrical Installation Code
Regulatory Document 5.2-093-2004
Safety Regulations 05-618-03
Safety Regulations 03-553-03
GOST 24754-2013

### TECHNICAL CHARACTERISTICS

| Installation |
|---|
| Class I, mine gas and dust;<br>Class II, subgroups of gas IIA, IIB+$H_2$, IIC (exept acetylene), Zones 1, 2;<br>Class III (dust), explosive dust atmospheres, containing volatile particles, non-conductive and conductive dust;<br>Underground mines, non-hazardous with gas (methane) and coal dust;<br>Facilities supervised by the Russian Maritime Register of Shipping;<br>Hazardous production facilities |

| Maximum voltage, V |
|---|
| ~1000 |

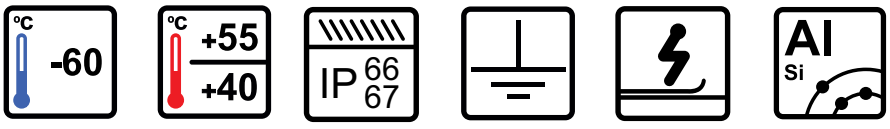
| Maximum electric current intensity, A |
|---|
| 400 |

| Maximum number of feeders, pcs |
|---|
| 160 |

| Electrical endurance, cycles |
|---|
| 10 000 |

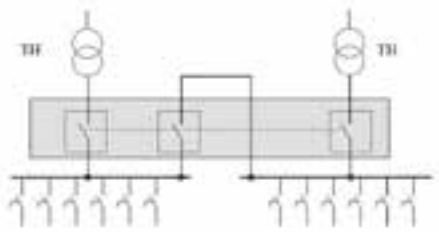
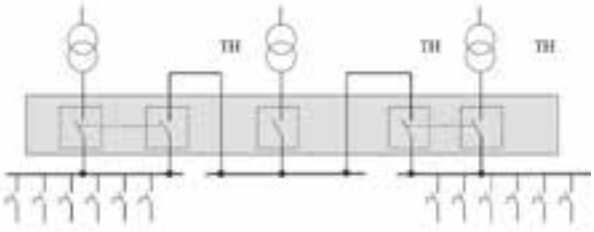
| Climatic category |
|---|
| NF1 (on request NF2, NF3, NF4, NF5, F1, F2, F3, F5, T1, T2, T3, T5, MU1, MU2, MU3, MU4, W2.13**, W5) |

| Chemical resistant version |
|---|
| On request C1, C2, C3 |

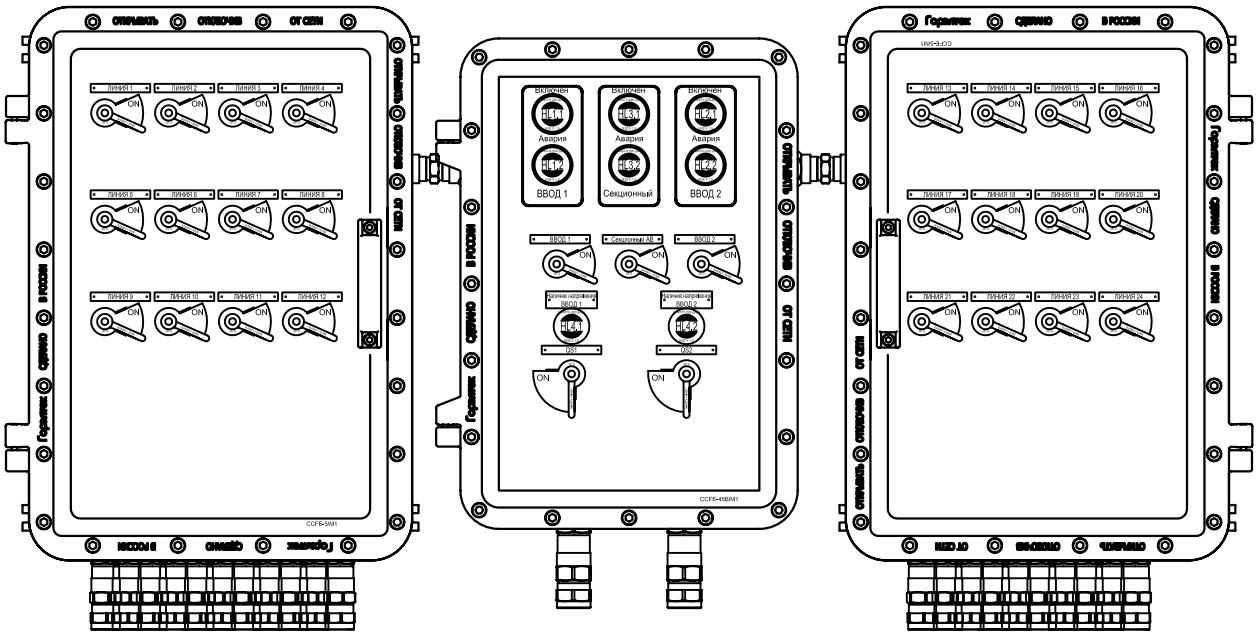


### OPTIONS, ACCESSORISES AND VERSIONS

| DESCRIPTION | MARKING |
|---|---|
| Anti-condensation cover | /AP |
| Drainage device for condensate draining | /DKUV |
| Version for the tropics with protection against insects | /TERMITI |
| Earthquake-resistant version | /MSK-64 |
| Customer acceptance | /PRIEMKA |
| Painting of external surface using the colour required by customer (on request) | /RAL (code) |
| Internal thermal insulation | /TEPLOIZOLYATSIYA |
| Heating | /OBOGREV |
| Layouts with obvious standby | /YAR |
| Layouts with unobvious standby | /NR |
| Bearing frame. Supporting bracket is according customer's layout | /RAMA |

| Automatic standby activation layout with unobvious standby | Automatic standby activation layout with obvious standby |
|---|---|
|  |  |

### FOR 45 FEEDERS BOARD OUTER APPEARENCE



***Note: Control boards with automatic standby activation are produced according to all requirements and wishes of the custome.***

*For mining explosion-proof version input miner terminal boxes with type of protection Exd are used.*

| | |
|---|---|
| Control and indication elements | See p. 345 |
| Recommended cable glands KNV, KOV, KNVTN, KNVTV, KNVM, KNVZ | See p. 365 |

• The nominal output voltage of 5V, 12V, 15V, 24V, 36V, in one, two, three and four channel versions, with different battery capacity.

• When connecting to the main - load electric power and battery power are carried out simultaneously.

• In the event of a power failure in the main, the battery discharges, ensuring load uninterrupted power supply.

• Source can be powered from the mains ~ 220V, or 12V , 24V or 36V DC power supply.

• Buffer version, in which the battery is permanently connected to a charger, which is a part of the source.

• In explosion-proof buffer power supplies controllers, made by STAR (Switching Technology Advanced Revision) technology are used.

### MARKING

Ex 1Ex d s IIC T5 Gb (for battery)
Ex 1Ex d IIC T6...T4 Gb X (for controller)
Ex 1Ex d IIB+$H_2$ T6...T4 Gb (for controller)
Ex Ex tb IIIC T100°C Db (for battery)
Ex Ex tb IIIC T70°C...T135°C Db (for controller)

### CERTIFICATES AND PERMITS

GOST R ISO 9001-2015 (ISO 9001:2015)
TC RU C-RU.AA87.B.00244
Permit of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia No. PPC 00-044017
Register of shipping (on request)
Specifications (TU) 3400-005-72453807-07
PJSC "GAZPROM" No. Г000.RU.1131.H00666

### NORMS

GOST 14254-96 (IEC 529-89)
GOST 30852.0-2002 (IEC 60079-0:1998)
GOST R IEC 60079-0-2011
GOST 30852.1-2002 (IEC 60079-1:1998)
GOST IEC 60079-1-2011
GOST 22782.3-77; TR CU 012/2011
GOST IEC 61241-1-1-2011
Ch. 7.3 of Electrical Installation Code
Ch. 7.4 of Electrical Installation Code

### TECHNICAL CHARACTERISTICS

| Installation |
|---|
| Class II, subgroups IIA, IIB, IIC, zones 1, 2;<br>Class III by dust, explosive dust atmospheres, which contain volatile solids, non-conducting and conducting dust;<br>Hazardous industrial facilities |

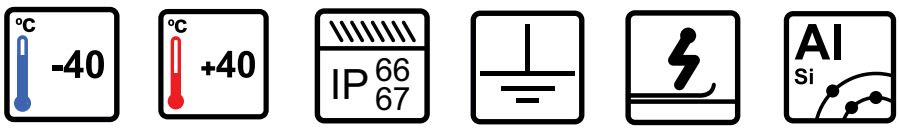
| Maximal voltage, V |
|---|
| ~48 |

| Maximal electric current intensity, A |
|---|
| 63 |

| Cable glands disposal |
|---|
| Cable or cable glands according to customer's request |

| Climatic category |
|---|
| NF1 (on request NF2, NF4, NF5, T1, T2, T3, T5, F5, MU1, MU2, MU3, MU4, MU5, W5) |

| Chemical resistant version |
|---|
| On request C1, C2, C3 |

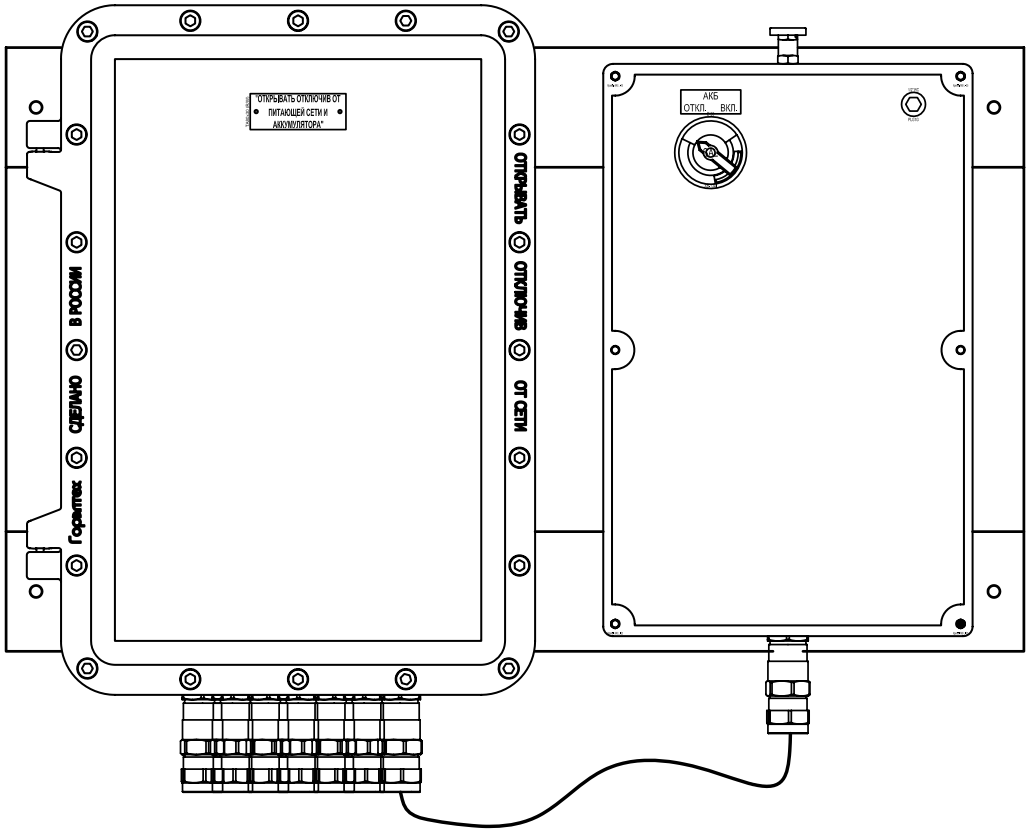


# SHGV-IBP SA-BUFIP

**OPTIONS, ACCESSORISES AND VERSIONS**

| DESCRIPTION | MARKING |
|---|---|
| Version for the tropics with protection against insects | /TERMITI |
| Customer acceptance | /PRIEMKA |
| Painting of external surface using the colour required by customer (on request) | /RAL(code) |
| Internal thermal insulation | /TEPLOIZOLIYACIYA |
| Heating | /OBOGREV |
| Bearing frame. Supporting bracket is according customer's layout | /RAMA |

**OVERALL AND MOUNTING DIMENSIONS (IN-FRAME CONSTRUCTION EXAMPLE)**




***SHGV-IBP** battery uninterruptable power supplies are produced in accordance with requirements and wishes of the customer.*

Recommended cable glands
KNV, KOV, KNVTN, KNVTV, KNVM, KNVZ
See p. 365

• The battery is equipped with a fuse in order to protect from short circuit and of power supply circuit catch knob, that allows installation or replacement directly in the hazardous area.

• When completing with a lead-acid electrochemical system (SLA), the battery is equipped with a fire-stop system of gases removing released during battery operation and allows to maintain the hydrogen concentration at a below 2% level.

• When completing with a lead-acid electrochemical system (SLA), VIP-AKB accumulator batteries can be equipped with electric heating, are connected to an external power source.

**MARKING**

Ex 1Ex d s IIC T5 Gb

Ex Ex tb IIIC T100°C Db

**CERTIFICATES AND PERMITS**

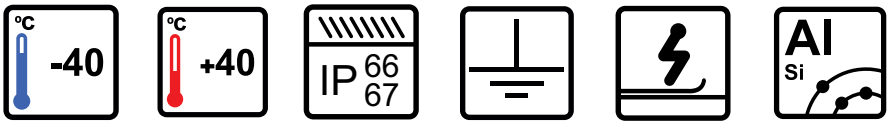
GOST R ISO 9001-2015 (ISO 9001:2015)
TC RU C-RU.AA87.B.00244
Register of shipping (on request)
Permit of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia No. 00-044017
Specifications (TU) 3400-005-72453807-07
PJSC "GAZPROM" No. Г000.RU.1131.H00666

**NORMS**

GOST 14254-96 (IEC 529-89)
GOST 30852.0-2002 (IEC 60079-0:1998)
GOST 30852.1-2002 (IEC 60079-1:1998)
TR CU 012/2011
GOST 22782.3-77
GOST R IEC 61241-1-1-2011
Ch. 7.3 of Electrical Installation Code
Ch. 7.4 of Electrical Installation Code

**TECHNICAL CHARACTERISTICS**

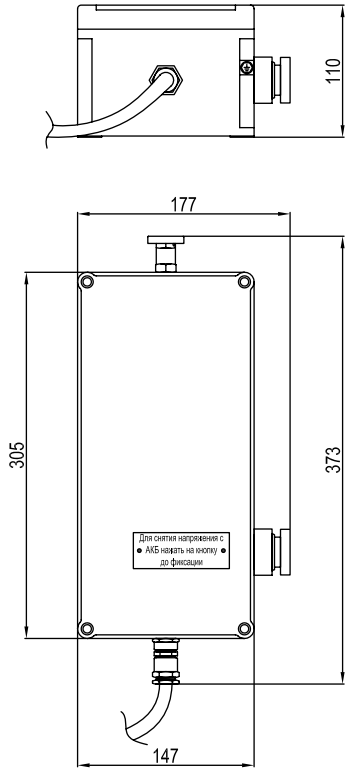
| | |
|---|---|
| **Installation** | Class II, subgroups IIA, IIB, IIC, zones 1, 2;<br>Class III by dust, explosive dust atmospheres, which contain volatile solids, non-conducting and conducting dust;<br>Hazardous industrial facilities |
| **Maximal voltage, V** | ~48 |
| **Maximal electric current intensity, A** | 63 |
| **Cable glands disposal** | Cable or cable glands according to customer's request |
| **Enclosure mounting** | 4 external fixing points |
| **Climatic category** | NF1 (on request NF2, NF4, NF5, T1, T2, T3, T5, F5, MU1, MU2, MU3, MU4, MU5, W5) |
| **Chemical resistant version** | On request C1, C2, C3 |



**OPTIONS, ACCESSORISES AND VERSIONS**

| DESCRIPTION | MARKING |
|---|---|
| Version for the tropics with protection against insects | /TERMITI |
| Customer acceptance | /PRIEMKA |
| Painting of external surface using the colour required by customer (on request) | /RAL (code) |
| Internal thermal insulation | /TEPLOIZOLIYACIYA |
| Heating | /OBOGREV |
| Bearing frame. Supporting bracket is according customer's layout | /RAMA |
| Mounting on the rail | /REYIKA |

**OVERALL AND MOUNTING DIMENSIONS FOR VIP-AKB 12 V 5A**




***VIP-AKB uninterruptable power supplies are produced in accordance with requirements and wishes of the customer.***

Recommended cable glands
KNV, KOV, KNVTN, KNVTV, KNVM, KNVZ
See p. 365

• Convenient Carrying case with handles and wheels.
• The nominal output voltage of 5V, 12V, 15V, 24V, 36V, in one, two, three and four channel versions, with different battery capacity.
• The battery operates in a cyclic mode «charge-discharge».
• Source can be powered from the mains ~ 220V, or 12V , 24V or 36V DC power supply.
• The source is equipped with explosion-proof plug plus socket unit with disconnect device and with reciprocal interlocking. Connections can be made in the hazardous area via VGM plug.

**MARKING**

VIP-AIP portable enclosure:
Ex II Gb
VIP-AKB Accumulator battery:
Ex 1Ex d s IIC T5 Gb
RGM-type socket:
Ex 1Ex d IIC T5 Gb

**CERTIFICATES AND PERMITS**

GOST R ISO 9001-2015 (ISO 9001:2015)
TC RU C-RU.AA87.B.00244
Permit of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia No. PPC 00-044017
Specifications (TU) 3400-005-72453807-07

**NORMS**

GOST R IEC 60079-0-2011
GOST 12.2.007.0-75
GOST 14254-96 (IEC 529-89)
GOST 30852.0-2002 (IEC 60079-0:1998)
GOST 30852.1-2002 (IEC 60079-1:1998)
TR CU 012/2011
GOST 22782.3-77
GOST 31441.1-2011
Ch. 7.3 of Electrical Installation Code
Ch. 7.4 of Electrical Installation Code

**TECHNICAL CHARACTERISTICS**

| | |
|---|---|
| **Installation** | Class II, subgroups IIA, IIB, IIC, zones 1, 2; Hazardous industrial facilities |
| **Maximal voltage, V** | ~12 / 24 / 48 (other voltage is by agreement) |
| **Maximal electric current intensity, A** | 63 |
| **Material** | High impact polypropylene resistant to salt fog and other chemicals |
| **Sockets disposal** | According to customer's layout |
| **Climatic category** | NF1 (on request NF4, NF5, T1, T2, T3, T5, F5, MU1, MU2, MU3, MU4, MU5, W5) |
| **Chemical resistant version** | On request C1, C2, C3 |

**OPTIONS, ACCESSORISES AND VERSIONS**

| DESCRIPTION | MARKING |
|---|---|
| Anti-condensation cover | /AP |
| Drainage device for condensate draining | /DKUV |
| Version for the tropics with protection against insects | /TERMITI |
| Customer acceptance | /PRIEMKA |
| Heating | /OBOGREV |

Recommended cable glands KNV, KOV, KNVTN, KNVTV, KNVM, KNVZ — See p. 365

# SHGV-PUSK CCFE-X-PUSK

• For local and / or remote motor control in an alternating current electrical networks, chemical, gas, oil and other industries electric installations, in areas with potentially explosive atmosphere.

### MARKING

1Ex d IIB+$H_2$ T6...T5 Gb
1Ex d IIC T6...T5 Gb X
Ex tb IIIC T85°C...T100°C Db

### MINING EQUIPMENT MARKING

RV Ex d I Mb
RN2

### CERTIFICATES AND PERMITS

GOST R ISO 9001-2015 (ISO 9001:2015)
TC RU C-RU.AA87.B.00244
РОСС RU.МШ06.Н00147
Permit of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia No. PPC 00-044017
Register of Shipping, Certificate of Type Approval No. 16.03665.315
Specifications (TU) 3400-005-72453807-07
PJSC "GAZPROM" No. Г000.RU.1131.Н00666

### NORMS

GOST 14254-96 (IEC 529-89)
GOST 24754-2013
GOST R IEC 60079-0-2011
GOST IEC 60079-1-2011
GOST IEC 61241-1-1-2011
GOST 30852.20-2002
GOST 12.2.007.0-75
Ch. 7.3 of Electrical Installation Code
Ch. 7.4 of Electrical Installation Code
TR CU 012/2011
Regulatory Document 5.2-093-2004
Safety Regulations 05-618-03
Safety Regulations 03-553-03

### TECHNICAL CHARACTERISTICS

| Installation |
|---|
| Class I, mine gas and dust;<br>Class II, subgroups of gas IIA, IIB+$H_2$, IIC (exept acetylene), Zones 1, 2<br>Class III by dust, explosive dust atmospheres, which contain volatile solids, non-conducting and conducting dust;<br>Underground mines, non-hazardous with gas (methane) and coal dust;<br>Facilities supervised by the Russian Maritime Register of Shipping<br>Hazardous industrial facilities |

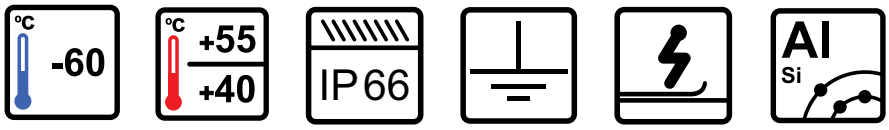
| Maximal voltage, V |
|---|
| 1000 |

| Maximal electric current intensity, A |
|---|
| 650 |

| Maximal switching frequency |
|---|
| 3600 operating cycles/hour |

| Climatic category |
|---|
| NF1 (on request NF2, NF3, NF4, NF5, F1, F2, F3, F5, T1, T2, T3, T5, MU1, MU2, MU3, MU4, W2.13**, W5) |

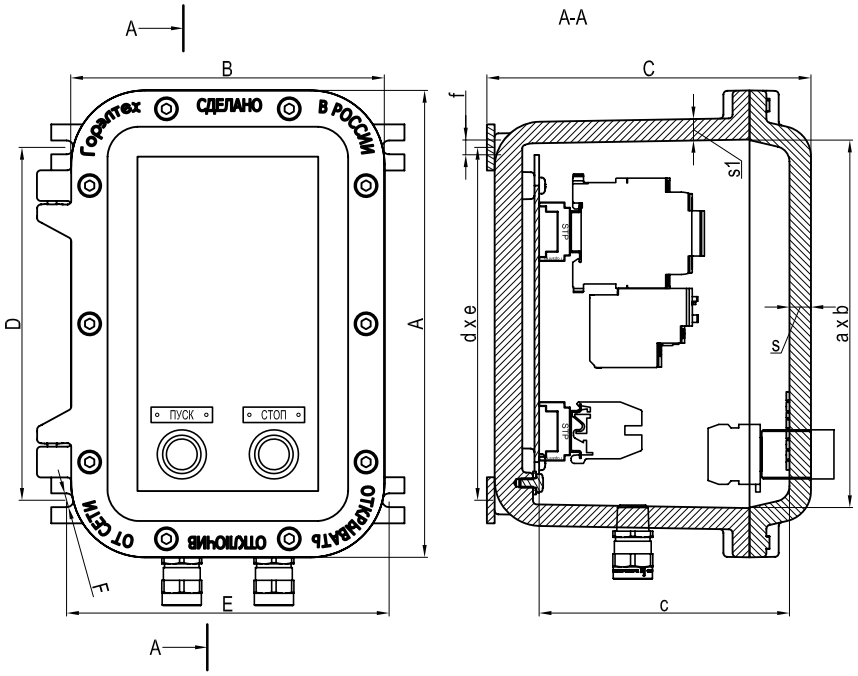
| Chemical resistant version |
|---|
| On request C1, C2, C3 |



## OPTIONS, ACCESSORISES AND VERSIONS

| DESCRIPTION | MARKING |
|---|---|
| Anti-condensation cover | /AP |
| Drainage device for condensate draining | /DKUV |
| Version for the tropics with protection against insects | /TERMITI |
| Earthquake-resistant version | /MSK-64 |
| Customer acceptance | /PRIEMKA |
| Painting of external surface using the colour required by customer (on request) | /RAL(code) |
| Enclosure material is highly corrosion-resistant chromium-nickel stainless casting steel | /N |
| Internal thermal insulation | /TEPLOIZOLIYACIYA |
| Heating | /OBOGREV |
| Smooth start | /PP |
| Remote monitoring and control via LAN | /MLS |

## OVERALL AND MOUNTING DIMENSIONS




*For mining explosion-proof version input miner terminal boxes with type of protection Exd are used.*

***OVERALL AND MOUNTING DIMENSIONS** of enclosures used for SHGV-PUSK starters*

| Enclosure typical size | Sizes, mm | | | | | | | | | | | | | | Enclosure weight, kg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | External | | | Internal | | | | | Stand. mounting | | | Mounting by clamp | | | |
| | A | B | C | a | b | c | S | S1 | D | E | F | d | e | f | |
| SHGV302021-PUSK | 304 | 204 | 211 | 240 | 140 | 163 | 14 | 14 | 230 | 130 | M8 | 230 | 210 | 9 | 8,83 |
| SHGV362821-PUSK | 364 | 284 | 215 | 300 | 220 | 157 | 20 | 14 | 290 | 210 | M8 | 290 | 290 | 9 | 14,97 |
| SHGV423222-PUSK | 425 | 325 | 226 | 361 | 261 | 163 | 24 | 14 | 350 | 350 | M10 | 350 | 330 | 11 | 20,7 |
| SHGV573931-PUSK | 576 | 396 | 318 | 506 | 329 | 247 | 26 | 20 | 360 | 236 | M10 | 360 | 376 | 11 | 48,1 |
| SHGV573926-PUSK | 576 | 396 | 268 | 506 | 326 | 197 | 26 | 20 | 360 | 236 | M10 | 360 | 376 | 11 | 44,4 |
| SHGV654526-PUSK | 650 | 450 | 265 | 570 | 370 | 150 | 16 | 16 | 550 | 350 | 10 | 550 | 446 | 11 | 51.6 |

***Correspondence of explosion-proof starters of different manufacturers****

| | | |
|---|---|---|
| UUKV-32 (without thermal relay) | SHGV302021-PUSK-M-2-220-2KOV3(S), 2KOV1(S) | Explosion-proof starter for 32A without thermal relay, local control, 2 cable glands KOV1, diameter of clamped cable is |
| UUKV-32 (with thermal relay) | SHGV362821-PUSK-M-32T-220-32-2KOV3(S), 2KOV1(S) | Explosion-proof starter for 32A with thermal relay, local control, 2 cable glands KOV1, diameter of clamped cable is |
| UUKV-32R (revers.,without thermal relay) | SHGV302021-PUSK-M-32R-220-2KOV3(S), 2KOV1(S) | Explosion-proof starter for 32A revers., without thermal relay, local control, 2 cable glands KOV1, diameter of clamped cable is |
| UUKV-32R (revers.with thermal relay) | SHGV362821-PUSK-M-32RT-220-32-2KOV3(S), 2KOV1(S) | Explosion-proof starter for 32A revers., with thermal relay, local control, 2 cable glands KOV1, diameter of clamped cable is 8–17 mm |

**You can also use the following order version: SHGV-PUSK starter which corresponds to UUKV-32 (without thermal relay).*

**MARKING FORMATION**

**SHGV-X-PUSK-D-X R T-X-X-X X(A)/X – Specifications (TU) 3400-005-72453807-07**

- Product name
- Size of enclosure (6 numbers)
- Remote control (or not mentioned)
- Rated current, A
- Reverse (or is not mentioned)
- Thermal relay (or not mentioned)
- Rated voltage of spool, V
- Thermal relay installation current, A
- Number of cable glands
- Cable glands type
- Cable glands side position designation
- Options, accessorises, versions

**Order example:** **SHGV302021-PUSK-9T-220-8-2KOV1(D) – Specifications (TU) 3400-005-72453807-07**

Starter based on SHORV302021, equipped with:

– 1 contactor for 9 A
– 1 thermal relay for 8 A
– 220 V voltage coil
– 2 buttons (Start, Stop) for local control
– 2 cable glands for KOV1 armor cable

If you find it difficult to choose the size of the required characteristic, put the letter X instead of figures after the name of the box (SHGV X-PUSK).

***Codes matching table***

| Previous international product names of "ZAVOD GORELTEX" CO. LTD. Specifications (TU) 3400-005-72453807-07 | Customs union code "ZAVOD GORELTEX" CO. LTD. Specifications (TU) 3400-005-72453807-07 |
|---|---|
| Starter | |
| CCFE-X-PUSK | SHGV-...-PUSK |
| CCFE-1R-PUSK | SHGV302021-PUSK |
| CCFE-3VR-PUSK | SHGV362821-PUSK |
| CCFE-4VR-PUSK | SHGV423222-PUSK |
| CCFE-45-PUSK | SHGV573931-PUSK |
| CCFE-45V-PUSK | SHGV573926-PUSK |
| CCFE-5V-PUSK | SHGV654526-PUSK |

| | |
|---|---|
| Control and indication elements | See p. 345 |
| Recommended cable glands KNV, KOV, KNVTN, KNVTV, KNVM, KNVZ | See p. 365 |

*SHGV...-PUSK typical starters*

| Code of order | Description |
|---|---|
| SHGV302021-PUSK-9-2KOV1 | Explosion-proof starter for 9 A without thermal relay, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-D-9-3KOV1 | Explosion-proof starter for 9 A without thermal relay, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-9T-2KOV1 | Explosion-proof starter for 9 A with thermal relay, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-D-9T-3KOV1 | Explosion-proof starter for 9 A with thermal relay, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-9R-2KOV1 | Explosion-proof starter for 9 A without thermal relay, reverse, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17mm |
| SHGV302021-PUSK-D-9R-3KOV1 | Explosion-proof starter for 9 A without thermal relay, reverse, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-9RT-2KOV1 | Explosion-proof starter for 9 A with thermal relay, reverse, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-D-9RT-3KOV1 | Explosion-proof starter for 9 A with thermal relay, reverse, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-12-2KOV1 | Explosion-proof starter for 12 A without thermal relay, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-D-12-3KOV1 | Explosion-proof starter for 12 A without thermal relay, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-12T-2KOV1 | Explosion-proof starter for 12 A with thermal relay, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-D-12T-3KOV1 | Explosion-proof starter for 12 A with thermal relay, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-12R-2KOV1 | Explosion-proof starter for 12 A without thermal relay, reverse, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-D-12R-3KOV1 | Explosion-proof starter for 12 A without thermal relay, reverse, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-12RT-2KOV1 | Explosion-proof starter for 12 A with thermal relay, reverse, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-D-12RT-3KOV1 | Explosion-proof starter for 12 A with thermal relay, reverse, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-18-2KOV1 | Explosion-proof starter for 18 A without thermal relay, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-D-18-3KOV1 | Explosion-proof starter for 18 A without thermal relay, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-18T-2KOV1 | Explosion-proof starter for 18 A with thermal relay, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-D-18T-3KOV1 | Explosion-proof starter for 18 A with thermal relay, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-18R-2KOV1 | Explosion-proof starter for 18 A without thermal relay, reverse, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-D-18R-3KOV1 | Explosion-proof starter for 18 A without thermal relay, reverse, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-18RT-2KOV1 | Explosion-proof starter for 18 A with thermal relay, reverse, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-D-18RT-3KOV1 | Explosion-proof starter for 18 A with thermal relay, reverse, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-25-2KOV1 | Explosion-proof starter for 25 A without thermal relay, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-D-25-3KOV1 | Explosion-proof starter for 25 A without thermal relay, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-25T-2KOV1 | Explosion-proof starter for 25 A with thermal relay, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-D-25T-3KOV1 | Explosion-proof starter for 25 A with thermal relay, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-25R-2KOV1 | Explosion-proof starter for 25 A without thermal relay, reverse, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-D-25R-3KOV1 | Explosion-proof starter for 25 A without thermal relay, reverse, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-25RT-2KOV1 | Explosion-proof starter for 25 A with thermal relay, reverse, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |

# SHGV-PUSK CCFE-X-PUSK

| Code of order | Description |
|---|---|
| SHGV362821-PUSK-D-25RT-3KOV1 | Explosion-proof starter for 25 A with thermal relay, reverse, remote control, 3 cable glands KOV1, the diameter of the clamped cable |
| SHGV302021-PUSK-32-2KOV1 | Explosion-proof starter for 32A without thermal relay, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-D-32-3KOV1 | Explosion-proof starter for 32A without thermal relay, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-32T-2KOV1 | Explosion-proof starter for 32A with thermal relay, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-D-32T-3KOV1 | Explosion-proof starter for 32A with thermal relay, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-32R-2KOV1 | Explosion-proof starter for 32A without thermal relay, reverse, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV302021-PUSK-D-32R-3KOV1 | Explosion-proof starter for 32A without thermal relay, reverse, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-32RT-2KOV1 | Explosion-proof starter for 32A with thermal relay, reverse, local control, 2 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-D-32RT-3KOV1 | Explosion-proof starter for 32A with thermal relay, reverse, remote control, 3 cable glands KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-40-2KOV2 | Explosion-proof starter for 40 A without thermal relay, local control, 2 cable glands KOV2, the diameter of the clamped cable is 15-25mm |
| SHGV362821-PUSK-D-40-2KOV2-1KOV1 | Explosion-proof starter for 40 A without thermal relay, remote control, 1 cable gland KOV2, the diameter of the clamped cable is 15-25mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-40T-2KOV2 | Explosion-proof starter for 40 A with thermal relay, local control, 2 cable glands KOV2, the diameter of the clamped cable is 15-25 mm |
| SHGV362821-PUSK-D-40T-2KOV2-1KOV1 | Explosion-proof starter for 40 A with thermal relay, remote control, 2 cable glands KOV2, the diameter of the clamped cable is 15-25 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-40R-2KOV2 | Explosion-proof starter for 40 A without thermal relay, reverse, local control, 2 cable glands KOV2, the diameter of the clamped cable is 15-25 mm |
| SHGV362821-PUSK-D-40R-2KOV2-1KOV1 | Explosion-proof starter for 40 A without thermal relay, reverse, remote control, 2 cable glands KOV2, the diameter of the clamped cable is 15-25mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-40RT-2KOV2 | Explosion-proof starter for 40 A with thermal relay, reverse, local control, 2 cable glands KOV2, the diameter of the clamped cable is 15-25 mm |
| SHGV362821-PUSK-D-40RT-2KOV2-1KOV1 | Explosion-proof starter for 40 A with thermal relay, reverse, remote control, 2 cable glands KOV2, the diameter of the clamped cable is 15-25mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-50-2KOV2 | Explosion-proof starter for 50A without thermal relay, local control, 2 cable glands KOV2, the diameter of the clamped cable is 15-25 mm |
| SHGV362821-PUSK-D-50-2KOV2-1KOV1 | Explosion-proof starter for 50 A without thermal relay, remote control, 2 cable glands KOV2, the diameter of the clamped cable is 15-25mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-50T-2KOV2 | Explosion-proof starter for 50A with thermal relay, local control, 2 cable glands KOV2, the diameter of the clamped cable is 15-25mm |
| SHGV362821-PUSK-D-50T-2KOV2-1KOV1 | Explosion-proof starter for 50 A with thermal relay, remote control, 2 cable glands KOV2, the diameter of the clamped cable is 15-25mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17mm |
| SHGV362821-PUSK-50R-2KOV2 | Explosion-proof starter for 50A without thermal relay, reverse, local control, 2 cable glands KOV2, the diameter of the clamped cable is 15-25mm |
| SHGV362821-PUSK-D-50R-2KOV2-1KOV1 | Explosion-proof starter for 50 A without thermal relay, reverse, remote control, 2 cable glands KOV2, the diameter of the clamped cable is 15-25 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-50RT-2KOV2 | Explosion-proof starter for 50A with thermal relay, reverse, local control, 2 cable glands KOV2, the diameter of the clamped cable is 15-25 mm |
| SHGV362821-PUSK-Д-50RT-2KOV2-1KOV1 | Explosion-proof starter for 50 A with thermal relay, reverse, remote control, 2 cable glands KOV2, the diameter of the clamped cable is 15-25 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-65-2KOV3 | Explosion-proof starter for 65A without thermal relay, local control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31 mm |
| SHGV362821-PUSK-D-65-2KOV3-1KOV1 | Explosion-proof starter for 65 A without thermal relay, remote control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-65T-2KOV3 | Explosion-proof starter for 65A with thermal relay, local control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31 mm |
| SHGV362821-PUSK-D-65T-2KOV3-1KOV1 | Explosion-proof starter for 65 A with thermal relay, remote control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-65R-2KOV3 | Explosion-proof starter for 65A without thermal relay, reverse, local control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31 mm |
| SHGV362821-PUSK-D-65R-2KOV3-1KOV1 | Explosion-proof starter for 65 A without thermal relay, reverse, remote control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |

| Code of order | Description |
|---|---|
| SHGV423222-PUSK-65RT-2KOV3 | Explosion-proof starter for 65A with thermal relay, reverse, local control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31 mm |
| SHGV423222-PUSK-D-65RT-2KOV3-1KOV1 | Explosion-proof starter for 65 A with thermal relay, reverse, remote control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-80-2KOV3 | Explosion-proof starter for 80A without thermal relay, local control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31 mm |
| SHGV362821-PUSK-D-80-2KOV3-1KOV1 | Explosion-proof starter for 80A without thermal relay, remote control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-80T-2KOV3 | Explosion-proof starter for 80A without thermal relay, reverse, local control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31 mm |
| SHGV362821-PUSK-D-80T-2KOV3-1KOV1 | Explosion-proof starter for 80A without thermal relay, reverse, remote control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV423229-PUSK-80R-2KOV3 | Explosion-proof starter for 80A with thermal relay, reverse, local control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31 mm |
| SHGV423229-PUSK-D-80R-2KOV3-1KOV1 | Explosion-proof starter for 80A with thermal relay, reverse, remote control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV423229-PUSK-80RT-2KOV3 | Explosion-proof starter for 80A with thermal relay, reverse, local control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31 mm |
| SHGV423229-PUSK-D-80RT-2KOV3-1KOV1 | Explosion-proof starter for 80A without thermal relay, reverse, remote control, 2 cable glands KOV3, the diameter of the clamped cable is 21-31mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV362821-PUSK-95-2KOV4 | Explosion-proof starter for 95A without thermal relay, local control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm |
| SHGV362821-PUSK-D-95-2KOV4-1KOV1 | Explosion-proof starter for 95A without thermal relay, remote control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV483222-PUSK-95T-2KOV4 | Explosion-proof starter for 95A with thermal relay, local control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm |
| SHGV483222-PUSK-D-95T-2KOV4-1KOV1 | Explosion-proof starter for 95A without thermal relay, reverse, remote control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV423229-PUSK-95R-2KOV4 | Explosion-proof starter for 95A with thermal relay, reverse, local control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm |
| SHGV423229-PUSK-D-95R-2KOV4-1KOV1 | Explosion-proof starter for 95A with thermal relay, reverse, remote control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV573926-PUSK-95RT-2KOV4 | Explosion-proof starter for 95A with thermal relay, reverse, local control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm |
| SHGV573926-PUSK-D-95RT-2KOV4-1KOV1 | Explosion-proof starter for 95A with thermal relay, reverse, remote control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV423222-PUSK-115-2KOV4 | Explosion-proof starter for 115A without thermal relay, local control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm |
| SHGV423222-PUSK-D-115-2KOV4-1KOV1 | Explosion-proof starter for 115A without thermal relay, remote control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV573926-PUSK-115T-2KOV4 | Explosion-proof starter for 115A with thermal relay, local control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm |
| SHGV573926-PUSK-D-115T-2KOV4-1KOV1 | Explosion-proof starter for 115A with thermal relay, remote control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV573926-PUSK-115R-2KOV4 | Explosion-proof starter for 115A without thermal relay, reverse, local control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm |
| SHGV573926-PUSK-D-115R-2KOV4-1KOV1 | Explosion-proof starter for 115A without thermal relay, reverse, remote control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV573926-PUSK-115RT-2KOV4 | Explosion-proof starter for 115A with thermal relay, reverse, local control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm |
| SHGV573926-PUSK-D-115RT-2KOV4-1KOV1 | Explosion-proof starter for 115A with thermal relay, reverse, remote control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV423222-PUSK-150-2KOV4 | Explosion-proof starter for 150A without thermal relay, local control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm |
| SHGV423222-PUSK-D-150-2KOV4-1KOV1 | Explosion-proof starter for 150A without thermal relay, remote control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |

# SHGV-PUSK CCFE-X-PUSK

| Code of order | Description |
|---|---|
| SHGV573926-PUSK-150T-2KOV4 | Explosion-proof starter for 150A with thermal relay, local control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm |
| SHGV573926-PUSK-D-150T-2KOV4-1KOV1 | Explosion-proof starter for 150A with thermal relay, remote control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV573926-PUSK-150R-2KOV4 | Explosion-proof starter for 150A without thermal relay, reverse, local control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm |
| SHGV573926-PUSK-D-150P-2KOV4-1KOV1 | Explosion-proof starter for 150A without thermal relay, reverse, remote control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |
| SHGV573926-PUSK-150RT-2KOV4 | Explosion-proof starter for 150A with thermal relay, reverse, local control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm |
| SHGV573926-PUSK-D-150RT-2KOV4-1KOV1 | Explosion-proof starter for 150A with thermal relay, reverse, remote control, 2 cable glands KOV4, the diameter of the clamped cable is 27-37 mm, 1 cable gland KOV1, the diameter of the clamped cable is 9-17 mm |

*In case of increasing of the size of the cable glands the dimensions of the enclosure may increase too.*

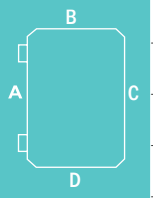
## EQUIPMENT SELECTION FORM FOR SHGV-PUSK (CCFE-X-PUSK)STARTER

| | | | | |
|---|---|---|---|---|
| Installation zones | ☐ Zone 1 | ☐ Zone 2 | ☐ RN version | ☐ RV version |
| | ☐ The required type of Ex protection _____ | | | |
| Temperature class | ☐ T4 | ☐ T5 | ☐ T6 | Operating temperature: $T_{ambient}$ from _____ to _____ |
| IP protection | ☐ IP66 (by default) | | | Group and subgroup of gas-air mixture: ☐ IIB+$H_2$ ☐ IIC X ☐ IIC ☐ IIIC |
| Material of enclosure | ☐ Corrosion-resistant aluminum-silicon alloy (by default) | ☐ Corrosion-resistant chromium-nickel stainless steel | | |
| Climatic category | NF1 (by default) | ☐ Other _____ | | |

### Characteristics of starter

| | | | |
|---|---|---|---|
| Type of engine connection | ☐ Reverse<br>☐ Non-reverse | Control | ☐ Local (with buttons on the body)<br>☐ Remote (with buttons on the body) |
| Power of engine | _____ kW | Rated voltage of engine | _____ V |
| Rated current of contactor | _____ A | The voltage control circuit (Coil) Contactor (~ or =) | _____ V |
| Current of thermal overload relay installation (if there is) | _____ A | | |

**Cable glands**




| Side of positioning A | B | C | D | Quantity of cables for 1 side | The diameter of the outer shell of the cable | | The diameter of the inner shell of the cable (only for armored cable) | | Type of cable gland | Mark of a cable |
|---|---|---|---|---|---|---|---|---|---|---|
| ☐ | ☐ | ☐ | ☐ | | | | | | | |
| ☐ | ☐ | ☐ | ☐ | | | | | | | |
| ☐ | ☐ | ☐ | ☐ | | | | | | | |
| ☐ | ☐ | ☐ | ☐ | | | | | | | |
| ☐ | ☐ | ☐ | ☐ | | | | | | | |

**Options, accessorises and versions**

| | |
|---|---|
| ☐ Anti-condensation cover /AP | ☐ The drainage device for draining of condensate /DKUV |
| ☐ Version for the tropics with protection against insects/TERMITI | ☐ Smooth start /PP |
| ☐ Earthquake-resistant version /MSK-64 | ☐ Customer's acceptance /PRIEMKA |
| ☐ Painting of external surface using the colour required by customer (on request)/RAL | ☐ Remote monitoring and control via LAN /MLS |
| ☐ Electrical heating /OBOGREV | ☐ Internal thermal insulation /TEPLOIZOLYACIYA |

| | |
|---|---|
| Quantity, pcs | ☐☐☐ pcs |

**Customer's notes**

Limiting of dimensions of cabinet (if there are): _____X_____X_____
length height depth

**Contact information**

| | |
|---|---|
| Organization: | Tel./fax: |
| Post address: | |
| Contact person: | E-mail: |

# SHGV-UPP CCFE-SOFTSTAR

- SHGV-UPP inverters are suited for pumps, fans drive control and in other simple systems, and also in complex systems, such as the management of the drilling drive, etc.
- SHGV-UPP inverters are designed on the principle of three phases management. These devices are without 1st and 2nd groups starters shortcomings, are not limited in the power range and allow the use of different methods for starting and stopping: with voltage control, current limiting, as well as modern technology - starting with torque control;
- On the basis of SCP-SHGV explosion-proof inverters the implementation of various auxiliary functions of inverters is possible;
- On the cover of SHGV-UPP enclosure according to customer's request digital displays to indicate the inverter status, indicator lights, handles, rheostats 1–2 ohms, control switches, emergency stop and reset buttons can be installed;
- There is a possibility to connect an additional braking device.

### MARKING

Ex 1Ex d IIC T4 Gb X
Ex 1Ex d IIB+$H_2$ T4 Gb
Ex Ex tb IIIC T135°C Db

### MINING EQUIPMENT MARKING

Ex RV Ex d I Mb
RN2

### CERTIFICATES AND PERMITS

GOST R ISO 9001-2015 (ISO 9001:2015)
TC RU C-RU.AA87.B.00244
РОСС RU.МШ06.Н00147
Permit of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia No. PPC 00-044017
Register of Shipping, Certificate of Type Approval No. 16.03666.315
Specifications (TU) 3400-005-72453807-07
PJSC "GAZPROM" No. Г000.RU.1131.Н00666

### NORMS

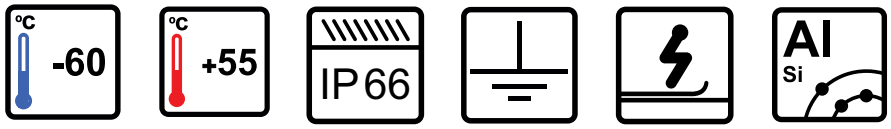
GOST 14254-96 (IEC 529-89)
GOST R IEC 60079-0-2011
GOST IEC 60079-1-2011
GOST IEC 61241-1-1-2011
GOST 24754-2013
GOST 12.2.007.0-75
GOST 30852.20-2002
Safety regulations 05-618-03
Safety regulations 03-553-03
TR CU 012/2011
Ch. 7.3 of Electrical Installation Code
Ch. 7.4 of Electrical Installation Code

### TECHNICAL CHARACTERISTICS

| Installation |
|---|
| Class I, mine gas and dust;<br>Class II, subgroups of gas IIA, IIB+$H_2$, IIC (exept acetylene), Zones 1, 2<br>Class III by dust, explosive dust atmospheres, which contain volatile solids, non-conducting and conducting dust;<br>Underground mines, non-hazardous with gas (methane) and coal dust;<br>Facilities supervised by the Russian Maritime Register of Shipping;<br>Hazardous industrial facilities |

| Climatic category |
|---|
| NF1 (on request NF2, NF3, NF4, NF5, F1, F2, F3, F5, T1, T2, T3, T5, MU1, MU2, MU3, MU4, W2.13**, W5) |

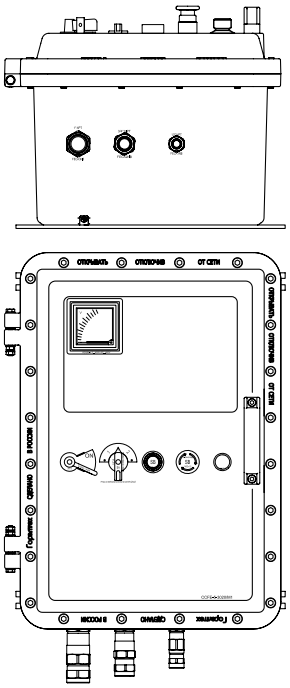
| Chemical resistant version |
|---|
| On request C1, C2, C3 |



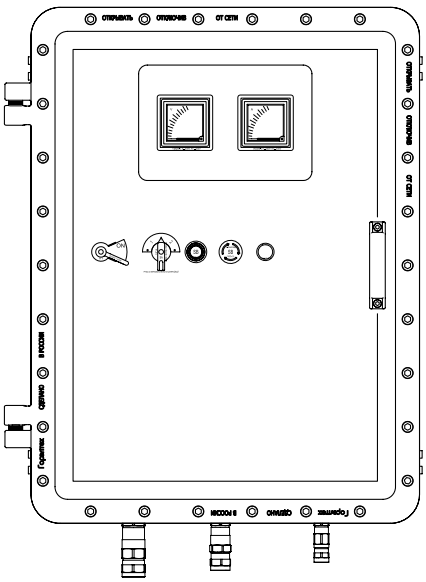
**OPTIONS, ACCESSORISES AND VERSIONS**

| DESCRIPTION | MARKING |
|---|---|
| Anti-condensation cover | /AP |
| Drainage device for condensate draining | /DKUV |
| Version for the tropics with protection against insects | /TERMITI |
| Earthquake-resistant version | /MSK-64 |
| Customer acceptance | /PRIEMKA |
| Painting of external surface using the colour required by customer (on request) | /RAL(code) |
| Enclosure material is highly corrosion-resistant chromium-nickel stainless casting steel | /N |
| Internal thermal insulation | /TEPLOIZOLIYACIYA |
| Heating | /OBOGREV |
| Additional incoming circuit breaker with control lever | /AVTOMAT |
| Dynamic braking device | / DINTOR |
| Braking resistor | /TR |
| Input disturbance RF filtre | /VCHVH |
| Output disturbance RF filtre | /VCHVYH |
| A capacitive filter for reducing the disturbance from the inverter | /FILTR |
| Explosion-proof remote control console DPU1 | /PKIV-DPU1 |
| Explosion-proof remote control console DPU2 | /PKIV-DPU2 |
| Bearing frame. Supporting bracket is according customer's layout | /RAMA |

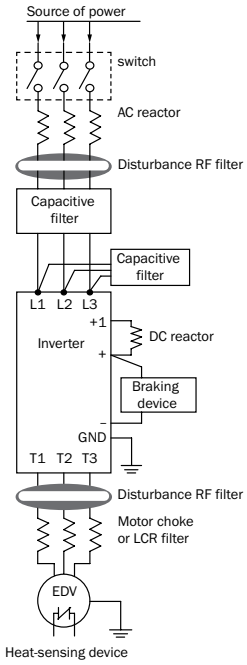
**EXAMPLE OF INVERTER UP TO 3 KW ACCORDING TO CUSTOMER'S LAYOUT**



**EXAMPLE OF INVERTER UP TO 10 KW ACCORDING TO CUSTOMER'S LAYOUT**



**PROCESS FUNCTIONAL DIAGRAM**




**MARKING FORMATION**

**SHGV-UPP – X – X / X – Specifications (TU) 3400-005-72453807-07**

- Product name
- Motor voltage, kW
- The number of cable glands, typical size
- Options, accessorises and versions

*There are restrictions on the technical parameters of the inverter output of more than 30 kW, for more information please contact the support center.

**Order example:** **SHGV-UPP-7,5-3KOV2(D)/OBOGREV – Specifications (TU) 3400-005-72453807-07.**

SHGV-UPP explosion-proof inverter for the engine of 7.5 kW capacity according to customer's. technical inquiry, 3 cable glands for KOV2 (side D)-type armor cable, with built-in heating system (/**OBOGREV**).

# SHGV-UPP CCFE-SOFTSTAR


| | |
|---|---|
| Control and indication elements | See p. 345 |
| Recommended cable glands KNV, KOV, KNVTN, KNVTV, KNVM, KNVZ | See p. 365 |


## EXAMPLE OF DIFFERENT INVERTERS SIZES LINE TECHNICAL FEATURES

| | SHGV-UPP-7,5-100 with inline EMC filter up to 7.5kW and 100% starting torque | SHGV-UPP-7,5-150 up to 7.5kW and 150% starting torque |
|---|---|---|
| Output frequency | 0.5–400 Hz | 0.5–400 Hz |
| Fidelity of the frequency | ± 0.1 Hz<br>(digital target) | ± 0.01% from maximal value (digital setting),<br>± 0.02% from maximal value(analogue setting) |
| Frequency change step | 0,01 Hz (digital setting) | |
| Input voltage | 1 phase – 200...240 V, +10 %, -15 %, 50/60 Hz ± 5 %,<br>3 phase – 200...240 V (corresponding to the input),<br>3 phase – 380...480 V, +10 %, -15 %, 50/60 Hz ± 5 %,<br>3 phase – 380...480 V (corresponding to the input) | 1 phase 200 V – 10% ~ 240 V + 5%, 50, 60 Hz ± 5%,<br>3 phase 380 V – 10% ~ 460 V + 10%; 50, 60 Hz ± 5% |
| Output voltage | 3 phases (since 0 V up to the supply voltage) | |
| V/F-characteristic | Controlled,<br>Changed (with constant or reduced moment) | |
| Overload capability | Up to 150% during 60 sec. | 150% of the nominal value (within 60 sec.),<br>maximum – 200% |
| ACC/DEC processing time | 0.01–3600 sec. (line, s-curved) | 0.01–3600 sec. |
| Braking | Soft stop function | Regenerative dynamic<br>Software Defined |
| Starting torque | 100% at a frequency of 6 Hz | 150% of the nominal value and higher |
| Place of operation | no more than 1000 m above sea level | |
| Vibration acceptable level | No more than 5.9 m/sec$^2$ (0.6 G), 10–55 Hz | |
| Communication interface | RS-485 (MODBUS RTU protocol) or other on customer's request | |
| Security functions | From overcurrent,<br>from overvoltage,<br>from overheating,<br>failure of the engine,<br>from non-normalized input voltage | |
| Additional functions | filter of C1 category according to EN 61800-3 | sensorless vector control,<br>autotune,<br>reduced torque,<br>high starting torque |

• SHGVA-VA with automatic switch are designed for control and protection against overloads and short circuits in the electrical circuit

• SHGVA-DVA with differential automatic switch are designed for control and overload protection, short-circuit or a current leakage in electric circuit .

• SHGVA-UZO with differential circuit breaker are designed for protection from current leakage in electric circuit.

### MARKING

Ex 1Ex d IIC T6...T5 Gb

Ex Ex tb IIIC T85°C ...T100°C Db

### MINING EQUIPMENT MARKING

Ex RV Ex d I Mb X

### CERTIFICATES AND PERMITS

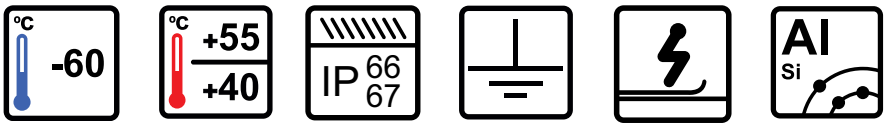
GOST R ISO 9001-2015 (ISO 9001:2015)
TC RU C-RU.AA87.B.00244
Permit of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia No. PPC 00-044017
Register of shipping (as per request)
Specifications (TU) 3400-005-72453807-07
PJSC “GAZPROM” No. Г000.RU.1131.H00666

### NORMS

GOST 12.2.007.0-75
GOST R IEC 60079-0-2011
GOST 30852.0-2002 (IEC 60079-0:1998)
GOST 30852.1-2002 (IEC 60079-1:1998)
GOST 30852.20-2002
TR CU 012/2011
GOST IEC 61241-1-1-2011
GOST 14254-96 (IEC 529-89)
Ch. 7.3 of Electrical Installation Code
Ch. 7.4 of Electrical Installation Code
Regulatory Document 5.2-093-2004
Safety regulations 05-618-03
Safety regulations 03-553-03

### TECHNICAL CHARACTERISTICS

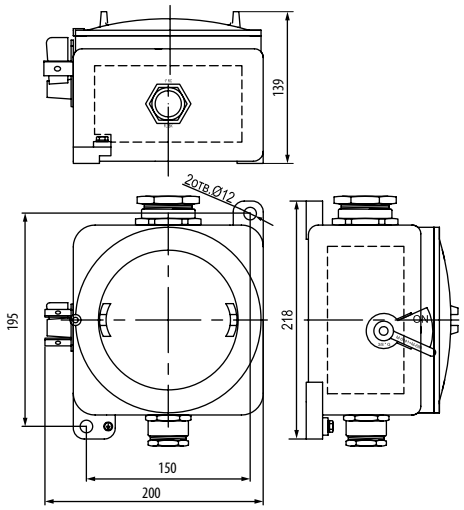
| Installation |
|---|
| Class I, mine gas and dust;;<br>Class II, subgroups of gas IIA, IIB, IIC, zones 1, 2;<br>Class III by dust, explosive dust atmospheres, which contain volatile solids, non-conducting and conducting dust;<br>Facilities supervised by the Russian Maritime Register of Shipping<br>Hazardous industrial facilities |
| **Maximum voltage, V** |
| ~1000 / ⎓250 |
| **Maximum electric current intensity, A** |
| 160 |
| **Climatic category** |
| NF1 (on request NF2, NF3, NF4, NF5, F1, F2, F3, F5, T1, T2, T3, T5, MU1, MU2, MU3, MU4, W2.13**, W5) |
| **Chemical resistant version** |
| On request C1, C2, C3 |



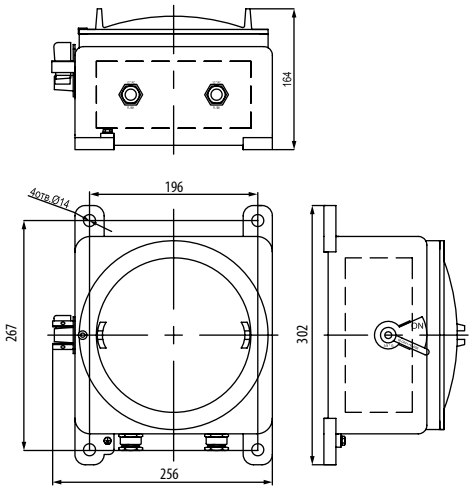
**OPTIONS, ACCESSORISES AND VERSIONS**

| DESCRIPTION | MARKING |
|---|---|
| Anti-condensation cover | /AP |
| Drainage device for condensate draining | /DKUV |
| Version for the tropics with protection against insects | /TERMITI |
| Customer acceptance | /PRIEMKA |
| Painting of external surface using the colour required by customer (on request) | /RAL(code) |
| Internal thermal insulation | /TEPLOIZOLIYACIYA |
| Heating | /OBOGREV |
| Auxiliary contacts (status contact, signaling contact) | /DK |
| The motor drive for remote control | /PDU |

**DESIGN PARAMETERS FOR NOMINAL CURRENT UP TO 63A**




**DESIGN PARAMETERS FOR RATED CURRENT SINCE 80A UP TO 125A**




*For mining explosion-proof version input miner terminal boxes with type of protection Exd are used.*

*SHGVA-VA typival automatic switches*

| Marking for order | Description | Marking for order | Description |
|---|---|---|---|
| SHGVA-VA-1-6 | Automatic switch 1 pole I=6 A | SHGVA-VA-3-6 | Automatic switch 3 poles I=6 A |
| SHGVA-VA-1-10 | Automatic switch 1 pole I=10 A | SHGVA-VA-3-10 | Automatic switch 3 poles I=10 A |
| SHGVA-VA-1-16 | Automatic switch 1 pole I=16 A | SHGVA-VA-3-16 | Automatic switch 3 poles I=16 A |
| SHGVA-VA-1-20 | Automatic switch 1 pole I=20 A | SHGVA-VA-3-20 | Automatic switch 3 poles I=20 A |
| SHGVA-VA-1-25 | Automatic switch 1 pole I=25 A | SHGVA-VA-3-25 | Automatic switch 3 poles I=25 A |
| SHGVA-VA-1-32 | Automatic switch 1 pole I=32 A | SHGVA-VA-3-32 | Automatic switch 3 poles I=32 A |
| SHGVA-VA -1-40 | Automatic switch 1 pole I=40 A | SHGVA-VA-3-40 | Automatic switch 3 poles I=40 A |
| SHGVA-VA -1-63 | Automatic switch 1 pole I=63 A | SHGVA-VA-3-63 | Automatic switch 3 poles I=63 A |
| SHGVA-VA -1-80 | Automatic switch 1 pole I=80 A | SHGVA-VA-3-80 | Automatic switch 3 poles I=80 A |
| SHGVA-VA -1-100 | Automatic switch 1 pole I=100 A | SHGVA-VA-3-100 | Automatic switch 3 poles I=100 A |
| SHGVA-VA -1-125 | Automatic switch 1 pole I=125 A | SHGVA-VA-3-125 | Automatic switch 3 poles I=125 A |
| SHGVA-VA -1-160 | Automatic switch 1 pole I=160 A | SHGVA-VA-3-160 | Automatic switch 3 poles I=160 A |
| SHGVA-VA-2-6 | Automatic switch 2 poles I=6 A | SHGVA-VA-4-6 | Automatic switch 4 poles I=6 A |
| SHGVA-VA-2-10 | Automatic switch 2 poles I=10 A | SHGVA-VA-4-10 | Automatic switch 4 poles I=10 A |
| SHGVA-VA-2-16 | Automatic switch 2 poles I=16 A | SHGVA-VA-4-16 | Automatic switch 4 poles I=16 A |
| SHGVA-VA-2-20 | Automatic switch 2 poles I=20 A | SHGVA-VA-4-20 | Automatic switch 4 poles I=20 A |
| SHGVA-VA-2-25 | Automatic switch 2 poles I=25 A | SHGVA-VA-4-25 | Automatic switch 4 poles I=25 A |
| SHGVA-VA-2-32 | Automatic switch 2 poles I=32 A | SHGVA-VA-4-32 | Automatic switch 4 poles I=32 A |
| SHGVA-VA-2-40 | Automatic switch 2 poles I=40 A | SHGVA-VA-4-40 | Automatic switch 4 poles I=40 A |
| SHGVA-VA-2-63 | Automatic switch 2 poles I=63 A | SHGVA-VA-4-63 | Automatic switch 4 poles I=63 A |
| SHGVA-VA-2-80 | Automatic switch 2 poles I=80 A | SHGVA-VA-4-80 | Automatic switch 4 poles I=80 A |
| SHGVA-VA-2-100 | Automatic switch 2 poles I=100 A | SHGVA-VA-4-100 | Automatic switch 4 poles I=100 A |
| SHGVA-VA-2-125 | Automatic switch 2 poles I=125 A | SHGVA-VA-4-125 | Automatic switch 4 poles I=125 A |
| SHGVA-VA-2-160 | Automatic switch 2 poles I=160 A | SHGVA-VA-4-160 | Automatic switch 4 poles I=160 A |

*SHGVA-DVA typical differential breakers*

| Marking for order | Description | Marking for order | Description |
|---|---|---|---|
| SHGVA-DVA-2-6-30 | Typical differential breakers 2 poles $I_{num}$=6 A, $I_{leakage}$=30 mA | SHGVA-DVA-2-6-300 | Typical differential breakers 2 poles, $I_{num}$=6 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-2-10-30 | Typical differential breakers 2 poles $I_{num}$=10 A, $I_{leakage}$=30 mA | SHGVA-DVA-2-10-300 | Typical differential breakers 2 poles, $I_{num}$=10 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-2-16-30 | Typical differential breakers 2 poles $I_{num}$=16 A, $I_{leakage}$=30 mA | SHGVA-DVA-2-16-300 | Typical differential breakers 2 poles, $I_{num}$=16 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-2-20-30 | Typical differential breakers 2 poles $I_{num}$=20 A, $I_{leakage}$=30 mA | SHGVA-DVA-2-20-300 | Typical differential breakers 2 poles, $I_{num}$=20 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-2-25-30 | Typical differential breakers 2 poles $I_{num}$=25 A, $I_{leakage}$=30 mA | SHGVA-DVA-2-25-300 | Typical differential breakers 2 poles, $I_{num}$=25 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-2-32-30 | Typical differential breakers 2 poles $I_{num}$=32 A, $I_{leakage}$=30 mA | SHGVA-DVA-2-32-300 | Typical differential breakers 2 poles, $I_{num}$=32 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-2-40-30 | Typical differential breakers 2 poles $I_{num}$=40 A, $I_{leakage}$=30 mA | SHGVA-DVA-2-40-300 | Typical differential breakers 2 poles, $I_{num}$=40 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-2-63-30 | Typical differential breakers 2 poles $I_{num}$=63 A, $I_{leakage}$=30 mA | SHGVA-DVA-2-63-300 | Typical differential breakers 2 poles, $I_{num}$=63 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-3-6-30 | Typical differential breakers 3 poles $I_{num}$=6 A, $I_{leakage}$=30 mA | SHGVA-DVA-3-6-300 | Typical differential breakers 3 poles, $I_{num}$=6 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-3-10-30 | Typical differential breakers 3 poles $I_{num}$=10 A, $I_{leakage}$=30 mA | SHGVA-DVA-3-10-300 | Typical differential breakers 3 poles, $I_{num}$=10 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-3-16-30 | Typical differential breakers 3 poles $I_{num}$=16 A, $I_{leakage}$=30 mA | SHGVA-DVA-3-16-300 | Typical differential breakers 3 poles, $I_{num}$=16 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-3-20-30 | Typical differential breakers 3 poles $I_{num}$=20 A, $I_{leakage}$=30 mA | SHGVA-DVA-3-20-300 | Typical differential breakers 3 poles, $I_{num}$=20 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-3-25-30 | Typical differential breakers 3 poles $I_{num}$=25 A, $I_{leakage}$=30 mA | SHGVA-DVA-3-25-300 | Typical differential breakers 3 poles, $I_{num}$=25 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-3-32-30 | Typical differential breakers 3 poles $I_{num}$=25 A, $I_{leakage}$=30 mA | SHGVA-DVA-3-32-300 | Typical differential breakers 3 poles, $I_{num}$=32 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-3-40-30 | Typical differential breakers 3 poles $I_{num}$=40 A, $I_{leakage}$=30 mA | SHGVA-DVA-3-40-300 | Typical differential breakers 3 poles, $I_{num}$=40 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-3-63-30 | Typical differential breakers 3 poles $I_{num}$=63 A, $I_{leakage}$=30 mA | SHGVA-DVA-3-63-300 | Typical differential breakers 3 poles, $I_{num}$=63 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-4-6-30 | Typical differential breakers 4 poles $I_{num}$=6 A, $I_{leakage}$=30 mA | SHGVA-DVA-4-6-300 | Typical differential breakers 4 poles, $I_{num}$=6 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-4-10-30 | Typical differential breakers 4 poles $I_{num}$=10 A, $I_{leakage}$=30 mA | SHGVA-DVA-4-10-300 | Typical differential breakers 4 poles, $I_{num}$=10 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-4-16-30 | Typical differential breakers 4 poles $I_{num}$=16 A, $I_{leakage}$=30 mA | SHGVA-DVA-4-16-300 | Typical differential breakers 4 poles, $I_{num}$=16 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-4-20-30 | Typical differential breakers 4 poles $I_{num}$=20 A, $I_{leakage}$=30 mA | SHGVA-DVA-4-20-300 | Typical differential breakers 4 poles, $I_{num}$=20 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-4-25-30 | Typical differential breakers 4 poles $I_{num}$=25 A, $I_{leakage}$=30 mA | SHGVA-DVA-4-25-300 | Typical differential breakers 4 poles, $I_{num}$=25 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-4-32-30 | Typical differential breakers 4 poles $I_{num}$=32 A, $I_{leakage}$=30 mA | SHGVA-DVA-4-32-300 | Typical differential breakers 4 poles, $I_{num}$=32 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-4-40-30 | Typical differential breakers 4 poles $I_{num}$=40 A, $I_{leakage}$=30 mA | SHGVA-DVA-4-40-300 | Typical differential breakers 4 poles, $I_{num}$=40 A, $I_{leakage}$=300 mA |
| SHGVA-DVA-4-63-30 | Typical differential breakers 4 poles $I_{num}$=63 A, $I_{leakage}$=30 mA | SHGVA-DVA-4-63-300 | Typical differential breakers 4 poles, $I_{num}$=63 A, $I_{leakage}$=300 mA |

*SHGVA-UZO safety shutdown typical devices*

| Marking for order | Description |
|---|---|
| SHGVA-UZO-2-25-30 | Safety shutdown typical devices 2 poles, $I_{num}$=25 A, $I_{leakage}$ = 30 mA |
| SHGVA-UZO-2-25-300 | Safety shutdown typical devices 2 poles, $I_{num}$=25 A, $I_{leakage}$=300 mA |
| SHGVA-UZO-2-40-30 | Safety shutdown typical devices 2 poles, $I_{num}$=40 A, $I_{leakage}$=30 mA |
| SHGVA-UZO-2-40-100 | Safety shutdown typical devices 2 poles, $I_{num}$=40 A, $I_{leakage}$=100 mA |
| SHGVA-UZO-2-40-300 | Safety shutdown typical devices 2 poles, $I_{num}$=40 A, $I_{leakage}$=300 mA |
| SHGVA-UZO-2-63-30 | Safety shutdown typical devices 2 poles, $I_{num}$=63 A, $I_{leakage}$=30 mA |
| SHGVA-UZO-2-63-300 | Safety shutdown typical devices 2 poles, $I_{num}$=63 A, $I_{leakage}$=300 mA |
| SHGVA-UZO-2-80-300 | Safety shutdown typical devices 2 poles, $I_{num}$=80 A, $I_{leakage}$=300 mA |
| SHGVA-UZO-2-100-300 | Safety shutdown typical devices 2 poles, $I_{num}$=100 A, $I_{leakage}$=300 mA |
| SHGVA-UZO-4-25-30 | Safety shutdown typical devices 4 poles, $I_{num}$=25 A, $I_{leakage}$=30 mA |
| SHGVA-UZO-4-25-300 | Safety shutdown typical devices 4 poles, $I_{num}$=25 A, $I_{leakage}$=300 mA |
| SHGVA-UZO-4-40-30 | Safety shutdown typical devices 4 poles, $I_{num}$=40 A, $I_{leakage}$=30 mA |
| SHGVA-UZO-4-40-300 | Safety shutdown typical devices 4 poles, $I_{num}$=40 A, $I_{leakage}$=300 mA |
| SHGVA-UZO-4-63-30 | Safety shutdown typical devices 4 poles, $I_{num}$=63 A, $I_{leakage}$=30 mA |
| SHGVA-UZO-4-63-100 | Safety shutdown typical devices 4 poles, $I_{num}$=63 A, $I_{leakage}$=100 mA |
| SHGVA-UZO-4-63-300 | Safety shutdown typical devices 4 poles, $I_{num}$=63 A, $I_{leakage}$=300 mA |
| SHGVA-UZO-4-80-300 | Safety shutdown typical devices 4 poles, $I_{num}$=80 A, $I_{leakage}$=300 mA |
| SHGVA-UZO-4-100-30 | Safety shutdown typical devices 4 poles, $I_{num}$=100 A, $I_{leakage}$=30 mA |
| SHGVA-UZO-4-100-100 | Safety shutdown typical devices 4 poles, $I_{num}$=100 A, $I_{leakage}$=100 mA |
| SHGVA-UZO-4-100-300 | Safety shutdown typical devices 4 poles, $I_{num}$=100 A, $I_{leakage}$=300 mA |
| SHGVA-UZO-4-125-30 | Safety shutdown typical devices 4 poles, $I_{num}$=125 A, $I_{leakage}$=30 mA |
| SHGVA-UZO-4-125-100 | Safety shutdown typical devices 4 poles, $I_{num}$=125 A, $I_{leakage}$=100 mA |
| SHGVA-UZO-4-125-300 | Safety shutdown typical devices 4 poles, $I_{num}$=125 A, $I_{leakage}$=300 mA |

**MARKING FORMATION**

**SHGVA-VA / X / X / X X / X – Specifications (TU) 3400-005-72453807-07**

- Article name
- Number of poles of a switch
- Rated current
- Number of cable glands
- Type of cable glands
- Options, accessorises and versions

**Order examp:** **SHGVA-VA-2-16-2KNV2 – Specifications (TU) 3400-005-72453807-07**

SHGVA-VA device, equipped with:
– 2-poles automatic switc for 16 A with control lever
– 2-cable glands for KNV2 non-armored cable (d = 12–17 mm)

| | |
|---|---|
| Control and indication elements | See p. 345 |
| Recommended cable glands KNV, KOV, KNVTN, KNVTV, KNVM, KNVZ | See p. 365 |

• The devices are designed for commutation, shutoff protection and protection of loads against overcurrent in low voltage circuits in hazardous areas.
• The possibility of control lever sealing.

IIC

### MARKING

Ex 1Ex d IIC T6...T4 Gb X
Ex 1Ex d IIB + $H_2$ T6...T4 Gb
Ex 1Ex d IIC T6...T4 Gb
Ex Ex tb IIIC T85°C...T135°C Db

### MINING EQUIPMENT MARKING

Ex RV Ex d I Mb
Ex RV Ex d I Mb X
RN2

### CERTIFICATES AND PERMITS

GOST R ISO 9001-2015 (ISO 9001:2015)
TC RU C-RU.AA87.B.00244
РОСС RU.МШ06.Н00147
Permit of the Federal Environmental, Industrial and Nuclear Supervision Service of Russia No. PPC 00-044017
Register of Shipping, Certificate of Type Approval No. 16.03666.315)
Specifications (TU) 3400-005-72453807-07
PJSC “GAZPROM” No. Г000.RU.1131.H00666

### NORMS

GOST 12.2.007.0-75
GOST 14254-96 (IEC 529-89)
GOST 30852.0-2002 (IEC 60079-0:1998)
GOST 30852.1-2002 (IEC 60079-1:1998)
GOST R IEC 60079-0-2011
GOST IEC 60079-1-2011
GOST IEC 61241-1-1-2011
GOST 30852.20-2002
TR CU 012/2011
GOST 24754-2013
Ch. 7.3 of Electrical Installation Code
Ch. 7.4 of Electrical Installation Code
Regulatory Document 5.2-093-2004
Safety regulations 05-618-03
Safety regulations 03-553-03

### TECHNICAL CHARACTERISTICS

**Installation**

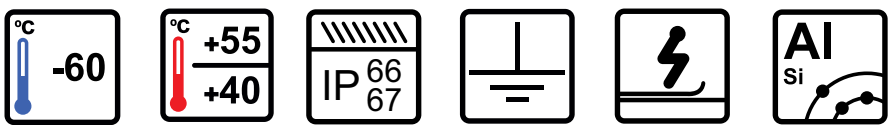
Class I, mine gas and dust;;
Class II, subgroups of gas IIA, IIB+$H_2$, IIC (exept acetylene), IIC, zones 1, 2;
Class III by dust, explosive dust atmospheres, which contain volatile solids, non-conducting and conducting dust;
Underground mines, non-hazardous with gas (methane) and coal dust;
Facilities supervised by the Russian Maritime Register of Shipping;
Hazardous industrial facilities

**Climatic category**

NF1 (on request NF2, NF3, NF4, NF5, F1, F2, F3, F5, T1, T2, T3, T5, MU1, MU2, MU3, MU4, W2.13**, W5)

**Chemical resistant version**

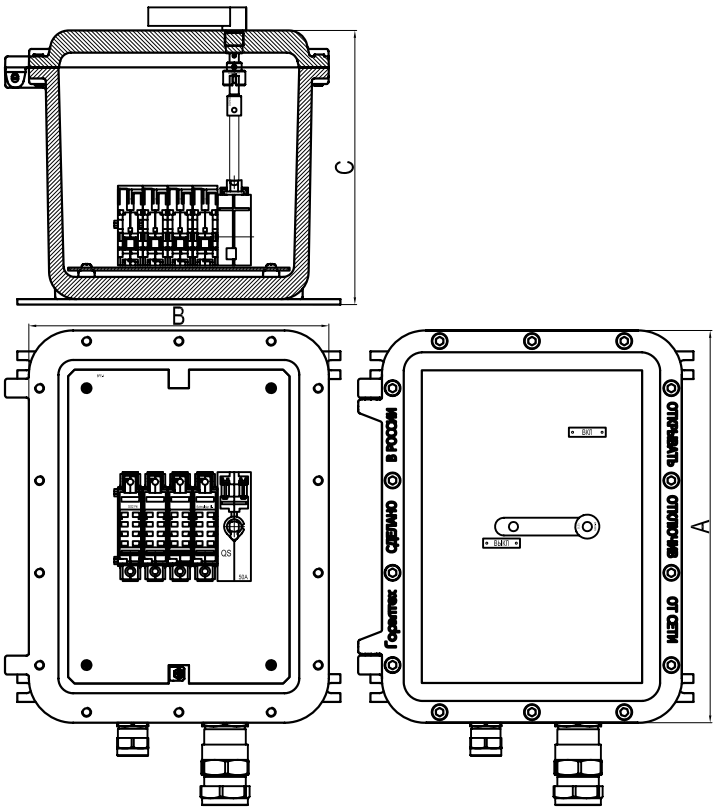
On request C1, C2, C3



### OPTIONS, ACCESSORISES AND VERSIONS

| DESCRIPTION | MARKING |
|---|---|
| Anti-condensation cover | /AP |
| Drainage device for condensate draining | /DKUV |
| Version for the tropics with protection against insects | /TERMITI |
| Climatic category MU1 | /MORE |
| Earthquake-resistant version | /MSK-64 |
| Customer acceptance | /PRIEMKA |
| Painting of external surface using the colour required by customer (on request) | /RAL (code) |
| Internal thermal insulation | /TEPLOIZOLIYACIYA |
| Heating | /OBOGREV |

### OVERALL AND MOUNTING DIMENSIONS FOR SHGV-VRP

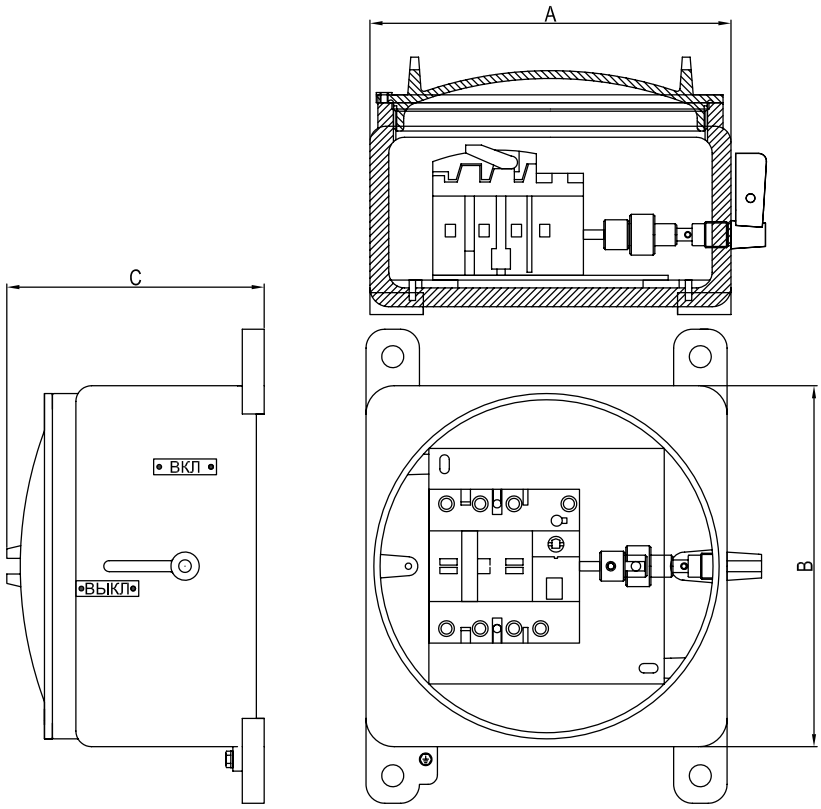



*For mining explosion-proof version input miner terminal boxes with type of protection Exd are used.*

| Item | Number of poles | Rated current | Typical size of thermal fuse | Dimensions (without cable glands) | | |
|---|---|---|---|---|---|---|
| | | | | A | B | C |
| SHGV-VRP-3P-32-... | 3 | 32 | C... | 304 | 204 | 218 |
| SHGV-VRP-3P+N-32-... | 4 | 32 | C... | 304 | 204 | 218 |
| SHGV-VRP-3P-50-... | 3 | 50 | E... | 364 | 284 | 218 |
| SHGV-VRP-4P-50-... | 4 | 50 | E... | 364 | 284 | 218 |
| SHGV-VRP-3P-100-... | 3 | 100 | F... | 432 | 332 | 229 |
| SHGV-VRP-4P-100-... | 4 | 100 | F... | 432 | 332 | 229 |
| SHGV-VRP-3P-160-... | 3 | 160 | G... | 560 | 380 | 253 |
| SHGV-VRP-4P-160-... | 4 | 160 | G... | 560 | 380 | 253 |
| SHGV-VRP-3P-250-... | 3 | 250 | H... | 632 | 432 | 271 |
| SHGV-VRP-4P-250-... | 4 | 250 | H... | 632 | 432 | 271 |
| SHGV-VRP-3P-400-... | 3 | 400 | J... | 870 | 650 | 380 |
| SHGV-VRP-4P-400-... | 4 | 400 | J... | 870 | 650 | 380 |
| SHGV-VRP-3P-630-... | 3 | 630 | K... | 870 | 650 | 480 |
| SHGV-VRP-4P-630-... | 4 | 630 | K... | 870 | 650 | 480 |
| SHGV-VRP-3P-1250-... | 3 | 1250 | L... | 1000 | 700 | 500 |


| | |
|---|---|
| Control and indication elements | See p. 345 |
| Recommended cable glands KNV, KOV, KNVTN, KNVTV, KNVM, KNVZ | See p. 365 |

## OVERALL AND MOUNTING DIMENSIONS FOR SHGVA-VRP




*For mining explosion-proof version input miner terminal boxes with type of protection Exd are used.*

| Item | Number of poles | Rated current | Typical size of thermal fuse | Dimensions (without cable glands) | | |
|---|---|---|---|---|---|---|
| | | | | A | B | C |
| SHGVA-VRP-3P-32-... | 3 | 32 | C... | 230 | 230 | 165 |
| SHGVA-VRP-3P+N-32-... | 4 | 32 | C... | 230 | 230 | 165 |
| SHGVA-VRP-3P-50-... | 3 | 50 | E... | 276 | 276 | 217 |
| SHGVA-VRP-4P-50-... | 4 | 50 | E... | 276 | 276 | 217 |
| SHGVA-VRP-3P-100-... | 3 | 100 | F... | 276 | 276 | 217 |
| SHGVA-VRP-4P-100-... | 4 | 100 | F... | 430 | 430 | 290 |
| SHGVA-VRP-3P-160-... | 3 | 160 | G... | 430 | 430 | 290 |
| SHGVA-VRP-4P-160-... | 4 | 160 | G... | 430 | 430 | 290 |

***Thermal fuses for switches-disconnectors-fuses***

| Typical size and type of thermal fuses | Rated voltage (V) | Rated current (A) | Propection from | |
|---|---|---|---|---|
| | | | short circuit | overload |
| C... (cylindrical 10x38) | ~ 500 | 0,16<br>0,25 | CA001 | – |
| | | 0,25 | CA002 | – |
| | | 0,5 | CA005 | – |
| | | 1 | CA01 | – |
| | | 2 | CA02 | CN02 |
| | | 4 | CA04 | CN04 |
| | | 6 | CA06 | CN06 |
| | | 8 | CA08 | CN08 |
| | | 10 | CA10 | CN10 |
| | | 12 | CA12 | CN12 |
| | | 16 | CA16 | CN16 |
| C... (cylindrical 10x38) | ~400 | 20 | CA20 | CN20 |
| | | 25 | CA25 | CN25 |
| | | 32 | CA32 | CN32 |

# SHGV-VRP, SHGVA-VRP CCFE-VRP, CCA-VRP

| Typical size and type of thermal fuses | Rated voltage (V) | Rated current (A) | Propection from | |
|---|---|---|---|---|
| | | | short circuit | overload |
| E... (cylindrical 14x51) | ~690 | 0,25 | EA002 | – |
| | | 0,5 | EA005 | – |
| | ~ 500 | 1 | EA01 | – |
| | | 2 | EA02 | – |
| | | 4 | EA04 | EN04 |
| | | 6 | EA06 | EN06 |
| | | 8 | EA08 | – |
| | | 10 | EA10 | EN10 |
| | | 12 | EA12 | – |
| | | 16 | EA16 | EN16 |
| | | 20 | EA20 | EN20 |
| | | 25 | EA25 | EN25 |
| | | 32 | EA32 | EN32 |
| | | 40 | EA40 | EN40 |
| | ~ 400 | 50 | EA50 | EN50 |
| F... (cylindrical 22x58) | ~690 | 4 | FA04 | – |
| | | 6 | FA06 | – |
| | | 8 | FA08 | – |
| | | 10 | FA10 | FN10 |
| | | 16 | FA16 | – |
| | | 20 | FA20 | FN20 |
| | | 25 | FA25 | FN25 |
| | | 32 | FA32 | FN32 |
| | | 40 | FA40 | FN40 |
| | | 50 | FA50 | FN50 |
| | ~ 500 | 63 | FA63 | FN63 |
| | | 80 | FA80 | FN80 |
| | | 100 | FA100 | FN100 |
| G... (prismatic with blade contacts) | ~ 500 | 50 | GA1051 | GN1051 |
| | | 63 | GA1061 | GN1061 |
| | | 80 | GA1081 | GN1081 |
| | | 100 | GA1101 | GN1101 |
| | | 125 | GA1121 | GN1121 |
| | | 160 | GA1161 | GN1161 |
| H... (prismatic with blade contacts) | ~ 500 | 160 | HA1161 | HN1161 |
| | | 200 | HA1201 | HN1201 |
| | | 250 | HA1251 | HN1251 |
| J... (prismatic with blade contacts) | ~ 500 | 250 | JA1251 | JN1251 |
| | | 315 | JA1311 | JN1311 |
| | | 400 | JA1401 | JN1401 |
| K... (prismatic with blade contacts) | ~ 500 | 400 | KA1401 | – |
| | | 500 | KA1501 | KN1501 |
| | | 630 | KA1631 | KN1631 |
| L... (prismatic with blade contacts) | ~ 500 | 630 | LA1631 | – |
| | | 800 | LA1801 | LN1801 |
| | | 1000 | LA1101 | LN1101 |
| | ~ 400 | 1250 | LA1251 | LN1251 |

**MARKING FORMATION**

**SHGV-VRP – X – XX – X – X / X – Specifications (TU) 3400-005-72453807-07**

- Type of device
- Number of poles
- Rated current of thermal fuse
- Type of thermal fuse
- Type of cable gland (side of disposal)
- Options, accessorises and versions

**Order example:** **SHGV-VRP-3P-250-NA1201-1KOV4(B)-1KNV5(D) – Specifications (TU) 3400-005-72453807-07.**

Explosion-proof switch-disconnector-fuse based on SHORV enclosure is three-poles for 250A rated current with fuse link for 200Afor protection against short-circuit current with one cable gland for KOV4 armor cable on side B and one KNV5 cable gland on side D. For the mining version (RV ExdI) the terminal box on the base of SHORV enclosure is used. The size of inlet box box depends on the size of used cables.