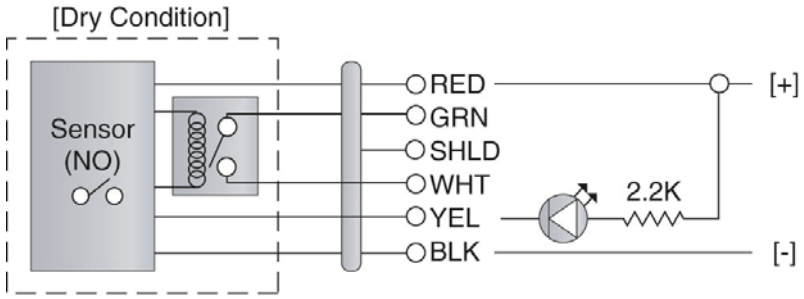
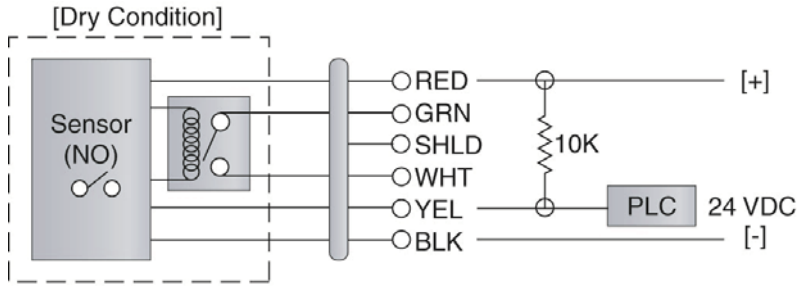
Maintenance Alarm (LZ12 Vibration only): For optimum performance and proactive maintenance, the sensor automatically adjusts for coating, and if necessary, outputs a preventative maintenance alarm. The Yellow wire is a NPN transistor designed to switch when a build-up of material prevents the vibration switch from operating at its operational frequency. Use the Yellow wire to identify when the Vibration switch requires cleaning. To wire the maintenance output wire to an LED, follow the wiring diagram below. The Yellow wire is connected to the LED and a 2.2kΩ resistor in series and referenced back to the (+) of the power supply.



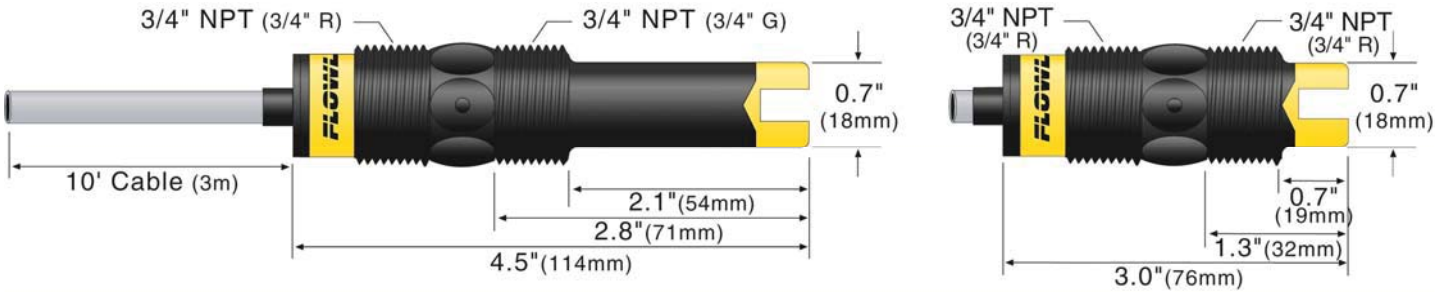
Sensor Power
[RED & BLK wires] / 36 VDC Max.
5 ±1mA Dry / 22 ±1mA Wet
Relay Rating
[GRN & WHT wires] / 60 VA
Maintenance Alarm
[YEL wire] / NPN Transistor / 10mA Max.

To wire the maintenance output wire to a PLC, follow the wiring diagram below. The Yellow wire is connected to the PLC input with a 10 kΩ resistor parallel to the PLC input and the (+) of the power supply.



Sensor Power
[RED & BLK wires] / 36 VDC Max.
5 ±1mA Dry / 22 ±1mA Wet
Relay Rating
[GRN & WHT wires] / 60 VA
Maintenance Alarm
[YEL wire] / NPN Transistor / 10mA Max.

Ultrasonic Switch (LU10 Series): The Ultrasonic level switch generates a 1.5 MHz ultrasonic wave from a miniature piezoelectric transducer located on one side of the gap within it's sensing tip. Another piezo transducer, located on the other side of the gap, acts as a microphone, picking up the sound wave. When liquid enters the gap, there is a change in the speed the wave crosses the gap. This change in the speed of sound identifies whether the sensor is in liquid or in air.



⚠ ***The sensor should be installed so that the liquid will drip out of the gap when the sensor becomes dry.***

LU10 Specifications:

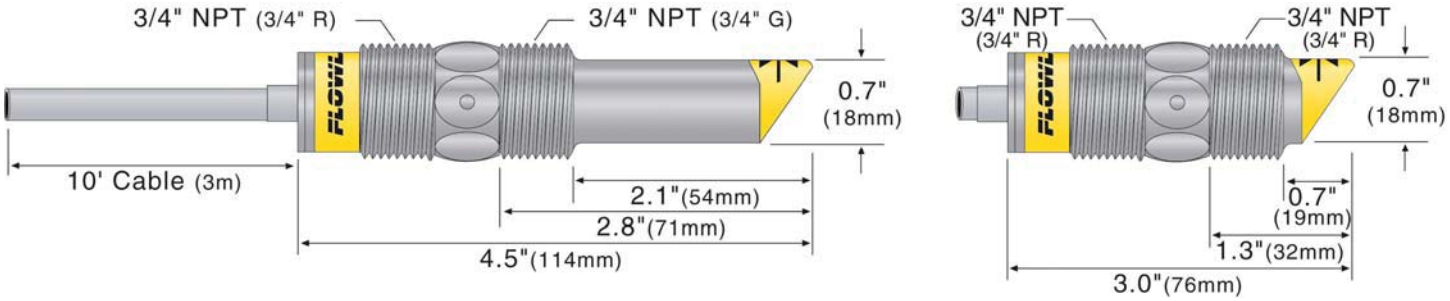
Sensor material:	1_ _5: PP 2_ _5: PFA	Cable jacket mat'l:	1_ _5: PP 2_ _5: PFA
Classification:	Intrinsically safe	Parameters:	CSA: Vmax = 32V, Imax = 300 mA, Pmax = 1.3 W; Ci = 0 µF, Li = 0 µH EEx: Ui = 32V; Ii = 300 mA; Pi = 1.3 W; Ci = 0 µF; Li = 0 µH
Approvals:	CSA: Class I, Groups A, B, C & D; Class II, Groups E, F and G; Class III EEx: Class 1, Division 1, Groups A, B, C, D; EEx ib IIC T6	Certificates:	CSA: LR 79326 EEx: LCIE 01.E6048 X

Configurations:

Part Number	Length	Material (body)	Material (cable)	Thread cable side x sensor side
LU10-1305	Short (3")	Polypropylene	Polypropylene	(¾" NPT) x (¾" NPT)
LU10-1325	Short (3")	Polypropylene	Polypropylene	(¾" R) x (¾"R)
LU10-1405	Long (4.5")	Polypropylene	Polypropylene	(¾" NPT) x (¾" NPT)
LU10-1425	Long (4.5")	Polypropylene	Polypropylene	(¾" R) x (¾"G)
LU10-2305	Short (3")	PFA	PFA	(¾" NPT) x (¾" NPT)
LU10-2325	Short (3")	PFA	PFA	(¾" R) x (¾"R)
LU10-2405	Long (4.5")	PFA	PFA	(¾" NPT) x (¾" NPT)
LU10-2425	Long (4.5")	PFA	PFA	(¾" R) x (¾"G)

Optic Leak Detection Switch (LO10 Series): The Optic Leak Detector use principles of optical refraction to detect the presence or absence of fluid. A pulsed infrared light beam is internally generated by a light emitting diode and aimed at the slanted optical tip of the sensor. If the tip is dry, the light beam bounces at a 90 degree angle to a receiving photo transistor, indicating a dry condition. If the tip is immersed in liquid, the light beam will refract out into the liquid instead of being reflected to the photo transistor, indicating a wet condition.

⚠ **The LO10 series is designed as a leak detection switch. The switch should be installed in applications where under normal conditions, it remains away from the liquid and will only come into contact during a leak.**



⚠ ***The Optic Leak Detector cannot detect the presence or absence of specular application liquids that reflect light (such as milk), or viscous liquids (such as paint) that form a coating on the sensor tip.***

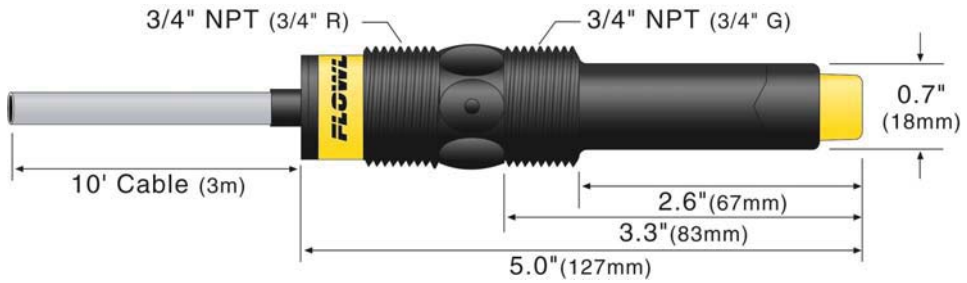
LO10 Specifications:

Sensor material: 1_ _5: PP 2_ _5: PFA	Cable jacket mat'l: 1_ _5: PP 2_ _5: PFA

Configurations:

Part Number	Length	Material (body)	Material (cable)	Thread cable side X sensor side
LO10-1305	Short (3")	Polypropylene	Polypropylene	(¾" NPT) x (¾" NPT)
LO10-1325	Short (3")	Polypropylene	Polypropylene	(¾" R) x (¾"R)
LO10-1405	Long (4.5")	Polypropylene	Polypropylene	(¾" NPT) x (¾" NPT)
LO10-1425	Long (4.5")	Polypropylene	Polypropylene	(¾" R) x (¾"G)
LO10-2305	Short (3")	PFA	PFA	(¾" NPT) x (¾" NPT)
LO10-2325	Short (3")	PFA	PFA	(¾" R) x (¾"R)
LO10-2405	Long (4.5")	PFA	PFA	(¾" NPT) x (¾" NPT)
LO10-2425	Long (4.5")	PFA	PFA	(¾" R) x (¾"G)

SuperGuard Capacitance Switch (LP15 Series): The SuperGuard level switch generates a pulse-wave radio frequency signal from the capacitance electrode located in the sensing tip of each sensor. When liquid comes into contact with the sensing tip, the capacitance as measured by the sensor changes based on the dielectric constant of the liquid. The guard circuit rejects the negative effects of coating buildup on the probe by eliminating the coating signal path between the active and reference electrodes.



⚠ ***The sensor's operation may vary based on the dielectric properties of various application liquids. The LP15 series sensor is factory-calibrated to be used with liquids with a dielectric value between 20 and 80. Liquids with a dielectric constant less than 20 will not be detected by an LP15 series sensor.***

Table of Common Dielectric Constants: NOTE: Liquids with a dielectric constant less than 20 will not be detected by an LP15 series level switch.

Acetone 21	Chlorotoluene 4.7	Ethylene chloride .. 10.5	Isobutyl methyl ketone 13	Nitrotoluene 25	Trichloroethylene 3.4
Acetoaldehyde 22.2	Chloroform ....4.5 to 5.0	Ethyl acetate 6.4	Jet fuel 1.7	Naphthalene ..2.3 to 2.5	Trichloroacetic acid 4.5
Acetyl methyl hexyl ketone 28	Chlorine, liquid 2.0	Ethyl salicylate 8.6	Lead carbonate 18	Oils, vegetable 2.5 to 3.5	Terephthalic acid ..... 1.5 to 1.7
Alcohol ..... 16 to 31	Carbon tetrachloride 2.2	Ethyl stearate 2.9	Lead nitrate 38	Oils, mineral ..2.3 to 2.4	Thinner 3.7
Ammonia ..... 15 to 25	Cyan 2.6	Ethyl silicote 4.1	Methyl salicylate 9.0	Oils, petroleum .....1.8 to 2.2	Urea 3.5
Acetic acid .... 4.1 to 6.2	Cyclohexane methanol 3.7	Formic acid 59	Methanol 33	Oleic acid 2.5	Vinyl chloride .. 2.8 to 6
Butyl chloride 9.6	D.I. Water 20	Ferric oleate 2.6	Methyl alcohol .33 to 38	Propane, liquid .....1.8 to 1.9	Vinyl alcohol 1.8 to 2.0
Barium chloride 9 to 11	Ethyl toluene 2.2	Freon 2.2	Margarine, liquid .....2.8 to 3.2	Potassium nitrate .....5.0 to 5.9	Water, 20°C 80
Benzene 2.3	Ethyl alcohol 23	Glycerine 47	Methyl acetate 7.3	Potassium chloride .. 5.0	Water, 100°C 48
Benzine 2.3	Ethylene glycol 37	Glycol 30	N-butyl formate 2.4	Stearic acid 2.3	
Barium nitrate 5.6	Ethylene oxide 14	Glycol nitrite 27	Nitrobenzene ...26 to 35	Toluene 2.4	
Bromine 3.1	Ethylene dichloride .....11 to 17	Gasoline ..... 2 to 2.2			
Chlorobenzene . 4.7 to 6		Hydrochloric acid ... 4.6			
		Isobutyric acid 2.7			

LP15 Specifications:

Dielectric range:	>20 constants	Sensor material:	PP
Conductive range:	>100 miromhos	Cable jacket mat'l:	PP

Configurations:

Part Number	Material (body)	Material (cable)	Thread cable side x sensor side
LP15-1405	Polypropylene	Polypropylene	(¾" NPT) x (¾" NPT)
LP15-1425	Polypropylene	Polypropylene	(¾" R) x (¾"G)

About Manual: PLEASE READ THE ENTIRE MANUAL PRIOR TO INSTALLING OR USING THIS PRODUCT. This manual includes information on all models of Flowline Switch-Tek™ Powered Level Switches: LZ12, LU10, LP15 and LO10 series. Please refer to the part number located on the sensor label to verify the exact model which you have purchased.

User's Responsibility for Safety: FLOWLINE manufactures a wide range of liquid level switches and technologies. While each of the these switches are designed to operate in a wide variety of applications, it is the user's responsibility to select a switch model that is appropriate for the application, install it properly, perform tests of the installed system, and maintain all components. The failure to do so could result in property damage or serious injury.

Proper Installation and Handling: Because this is an electrically operated device, only properly trained staff should install and/or repair this product. Use a proper sealant with all installations. *Note: Always install the 3/4" Viton gasket with all versions of Switch-Tek™ with metric threads. The G threaded version will not seal unless the gasket is properly installed.* Never over tighten the sensor within the fitting, beyond a maximum of 80 inch-pounds torque. Always check for leaks prior to system start-up.

Material Compatibility: The LU10 and LO10 series sensors are available in two different wetted materials. Models L_10-1__5 are made of Polypropylene (PP). Models L_10-2__5 are made of Perfluoroalkoxy (PFA). The LZ12 series is made of made of Ryton® (40% glass filled) and the LP15 series is made of PP. Make sure that the model you have selected is compatible with the application liquid. To determine the chemical compatibility between the sensor and its application liquids, refer to an industry reference such as the Compass Corrosion Guide (available from Compass Publications, phone 858-589-9636).

Wiring and Electrical: The supply voltage used to power the sensor should never exceed a maximum of 36 volts DC *(30 VDC for LZ12 series)*. Electrical wiring of the sensor should be performed in accordance with all applicable national, state, and local codes.

Flammable, Explosive and Hazardous Applications: Only the LU10-___5 series switch is rated for use in hazardous locations. Refer to the Certificate of Compliance for all applicable intrinsically safe ratings and entity parameters. Refer to the National Electric Code (NEC) for all applicable installation requirements in hazardous locations. **DO NOT USE THE LZ12, LP15 OR LO10 SERIES GENERAL PURPOSE SWITCH IN HAZARDOUS LOCATIONS.**

Warning

The rating for the relay is 60 VA (125 VAC max / 1A max).

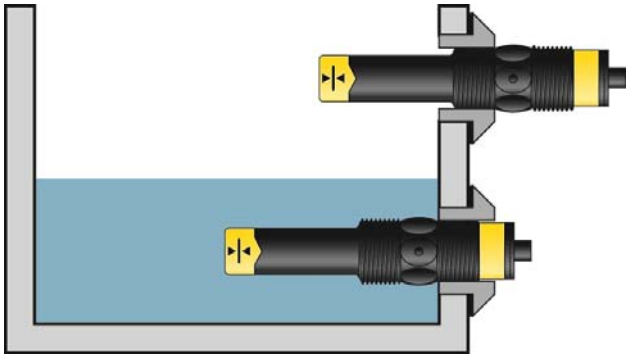
Flowline's Switch-Tek™ level switches are not recommended for use with electrically charged application liquids. For most reliable operation, the liquid being measured may need to be electrically grounded.

Always install the 3/4" Viton gasket with all versions of the powered sensors with metric threads. The G threaded version will not seal unless the gasket is installed properly.

Make a Fail-Safe System: Design a fail-safe system that accommodates the possibility of switch and/or power failure. FLOWLINE recommends the use of redundant backup systems and alarms in addition to the primary system. Adding a redundant high level float switch to the system is a cost effective means to prevent costly tank overflows.

All of the Switch-Tek™ Powered Level Sensors have a single internal relay. The normally open (NO) or normally closed (NC) operation is user selected based on the desired system control. Always design a fail-safe system that accommodates for the possibility of functional and/or power failure to the instrument. The "normal" relay state is where the relay coil is de-energized and the relay indicator is OFF. Therefore, if power is cut OFF to the switch it will de-energize the relay. Make sure that the de-energized state is the safe state in your system design. As such, if switch power is lost, a pump will turn OFF if it is connected to the normally open side of the relay.

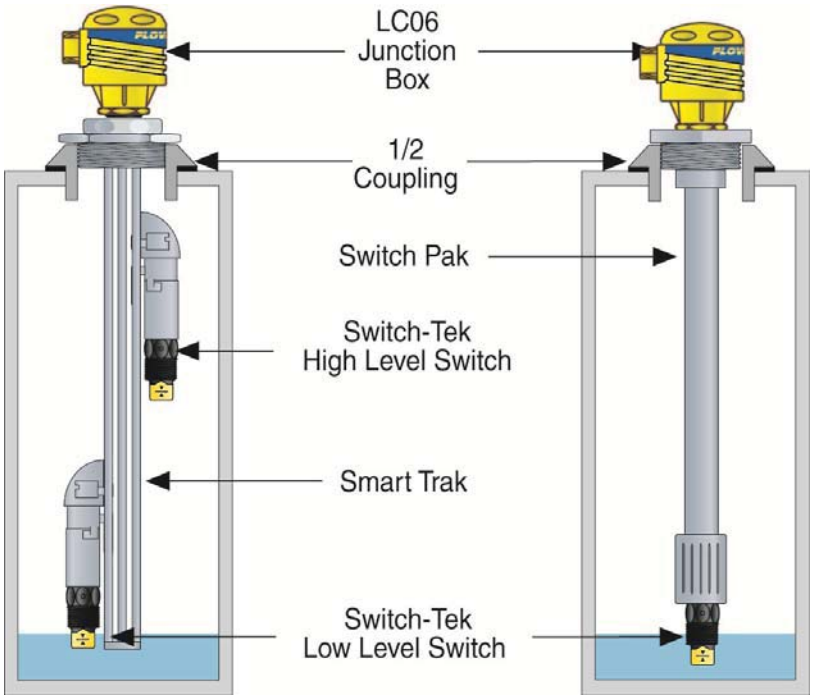
Through Wall Installation: Flowline's Switch-Tek™ level switches may be installed through the top, side or bottom of a tank wall. The sensor has male 3/4" NPT threads on either side of a 15/16" wrench flat. This enables the user to select the sensor's mounting orientation, installed outside of the tank in, or inside of the tank out.



⚠ ***Always install the 3/4" Viton gasket with the metric (long sensor length) versions of the L_ _ _-_ _2_. The G threaded version of the Switch-Tek™ will not seal unless the gasket is installed properly.***

Top Wall Installation: The powered level switches may be installed through the top wall of a tank. Flowline's Smart Trak LM10 series mounting system is an in-tank fitting which enables users to install up to four FLOWLINE sensors of any technology, to any depth, along the entire length of track. Smart Trak may be installed through the top wall of any tank using a standard 2" NPT tank adapter. If no tank top installation is available, Flowline's side mount bracket, LM50-1001, enables Smart Trak to be installed directly to the side wall of a tank. *Do not use PFA Teflon sensors with Smart-Trak.*

Flowline's Switch Pak LM45 series mounting system is an in-tank fitting which enables users to install one FLOWLINE sensor, of any technology, to a specific depth. The Flowline sensor may be installed onto the 3/4" NPT adapter at the end of the Switch Pak. Switch Pak may be installed through the top wall of any tank using a standard 2" NPT tank adapter. Flowline's side mount bracket, model LM50-1001, may also be used if top wall installation is not available.

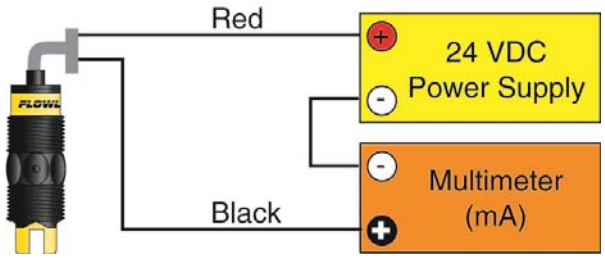


Supply Voltage: The supply voltage to the Switch-Tek™ level switch should never exceed a maximum of 36 VDC. Flowline controllers have a built-in 13.5 VDC power supply which provides power to all of Flowline's electrically powered sensors. Alternative controllers and power supplies, with a minimum output of 12 VDC up to a maximum output of 36 VDC (30 VDC with LZ12 series), may also be used with the Switch-Tek™ level switch.

Required Cable Length: Determine the length of cable required between the Switch-Tek™ level switch and its point of termination. Allow enough slack to ensure the easy installation, removal and/or maintenance of the sensor. The cable length may be extended up to a maximum of 1000 feet, using a well-insulated, 14 to 20 gauge shielded four conductor cable.

Wire Stripping: Using a 10 gauge wire stripper, carefully remove the outer layer of insulation from the last 1-1/4" of the sensor's cable. Unwrap and discard the exposed foil shield from around the signal wires, leaving the drain wire attached if desired. With a 20 gauge wire stripper, remove the last 1/4" of the colored insulation from the signal wires.

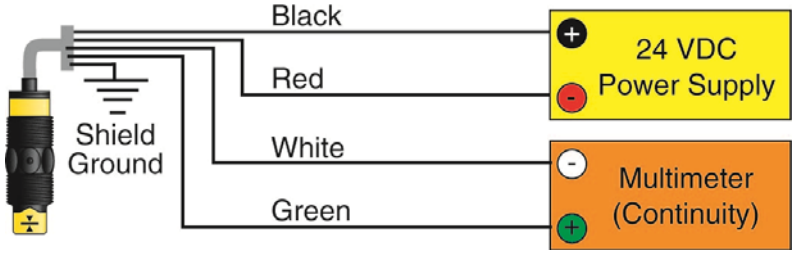
Signal Outputs (Current sensing): The standard method used by Flowline controllers; this technology uses only two wires (Red and Black). The sensor draws 5 mA when it is dry, and 22 mA when wet. NC/NO status must be set by the controller. The White and Green wires are not used.



Signal Output (Relay switching): Allows the sensor to switch a small load on or off directly, using an internal 1A relay (60 VAC/60 VDC). Only model LU10-___5 uses the relay and features 4 wires (red, black, white and green) and a shield wire. The NO/NC status is set by the polarity of the voltage feeding the red and black wires. The green wire is the common for the relay and the white wire is the NO or NC, depending on the polarity of red and black.

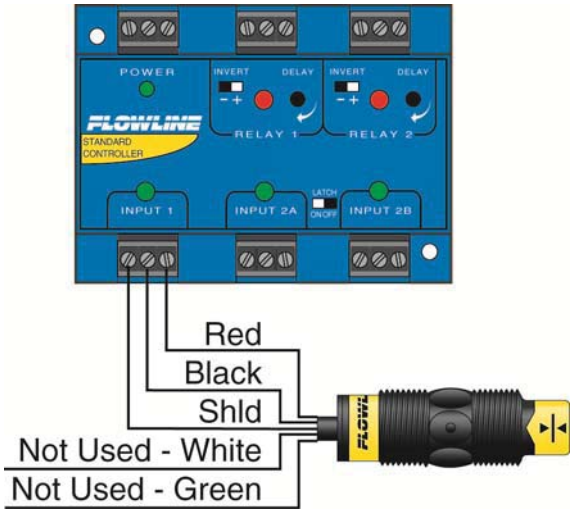
Normally Open Wiring:

Normally Closed Wiring:

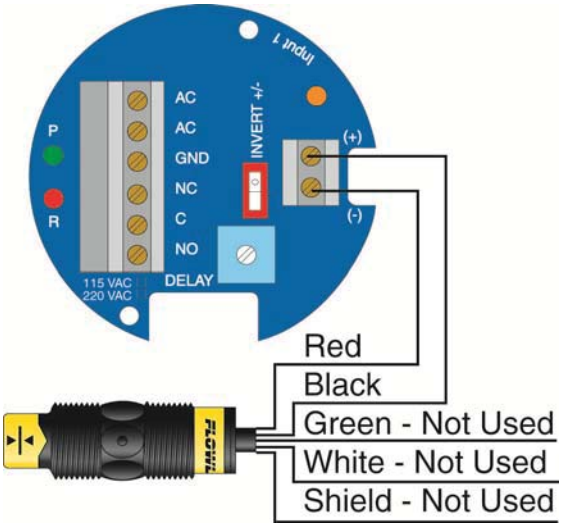


Wiring to a FLOWLINE Controller

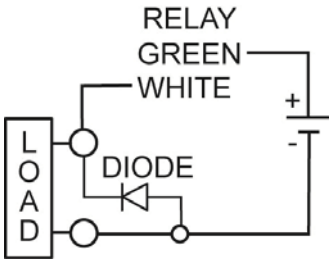
LC40 Series Controller (4 or 20 mA output)**:**
LC42-1001 Shown



LC10/LC11 Series Controller (4 or 20 mA output)**:**
LC11-1001 shown



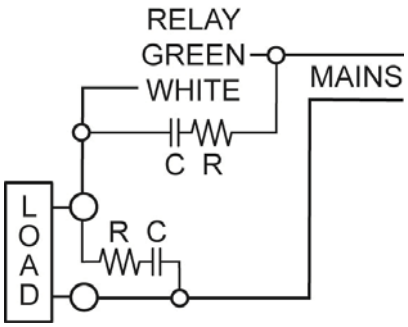
Switching Inductive Loads: The use of suppressors (snubbers) is strongly recommended when switching inductive loads to prevent disrupting the microprocessor's operation. The suppressors also prolong the life of the relay contacts. Suppression can be obtained with a catch diode for DC circuits and a resistor-capacitor (RC) for AC circuits.



Catch Diode

- Always use stepper relays between the sensor and external loads. For DC circuits use a catch diode such as 1N4148, shown on left.

Refer to the following circuits for RC network assembly and installation:



Choose R and C as follows:

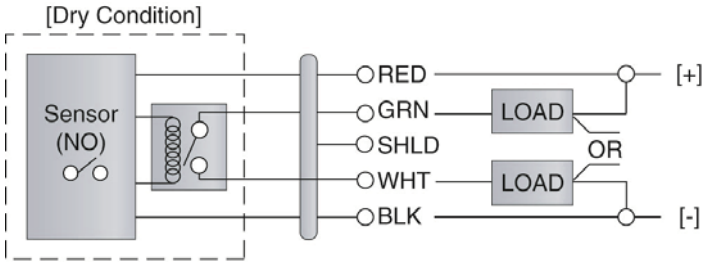
- R: 0.5 to 1 Ohms for each volt across the contacts
- C: 0.5 to 1 µF for each amp through closed contacts

Notes:

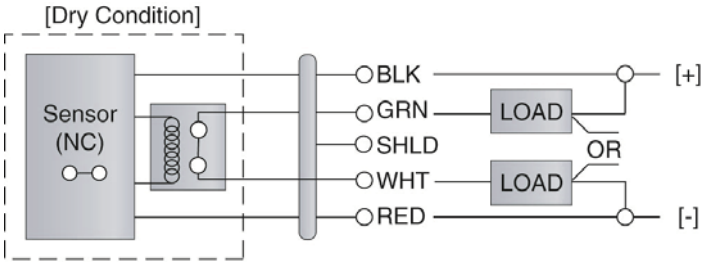
1. Use capacitors rated for 250 VAC.
2. RC networks may affect load release time of solenoid loads. Check to confirm proper operation.
3. Install the RC network at the meters relay screw terminals. An RC network may also be installed across the load. Experiment for best results.

Wiring the Relay Output: Switch-Tek™ requires 12 - 36 VDC (30 VDC max. for LZ12 series) power to operate the sensor and switch the relay. All illustrations below identify a Dry switch state as the normal position of the relay.

Switching a Normally Open DC Load:
The Red wire connects to Positive (+) of the power supply and the Black wire connects to Negative (-). The LOAD can be attached to either the Green or White wires. Complete the circuit by connecting the Green to (+) VDC power or White to (-) VDC power (see illustration below).

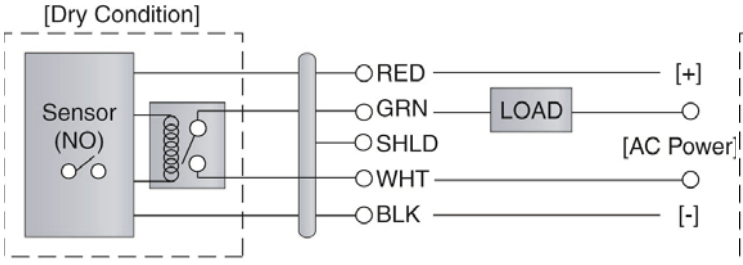


Switching a Normally Closed DC Load:
The Black wire connects to Positive (+) of the power supply and the Red wire connects to Negative (-). The LOAD can be attached to either the Green or White wires. Complete the circuit by connecting the Green to (+) VDC power or White to (-) VDC power (see illustration below).

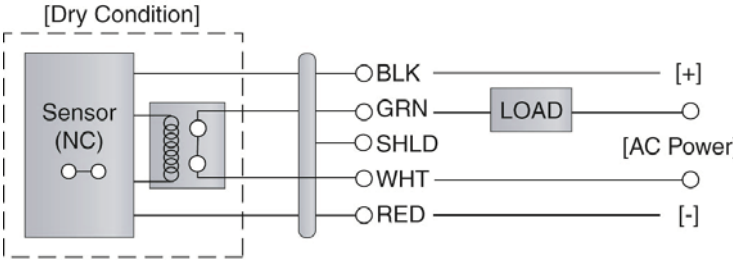


Sensor Power	*Relay Rating*
[RED & BLK wires] / 36 VDC Max. 5 ±1mA Dry / 22 ±1mA Wet	[GRN & WHT wires] / 60 VA

Switching a Normally Open AC Load:
The Red wire connects to Positive (+) of the DC power supply and the Black wire connects to Negative (-). The LOAD can be attached to the Green wire and the Hot of the VAC power. Connect the White to the Neutral of the VAC power (see illustration below).



Switching a Normally Closed AC Load:
The Black wire connects to Positive (+) of the DC power supply and the Red wire connects to Negative (-). The LOAD can be attached to the Green wire and the Hot of the VAC power. Connect the White to the Neutral of the VAC power (see illustration below).

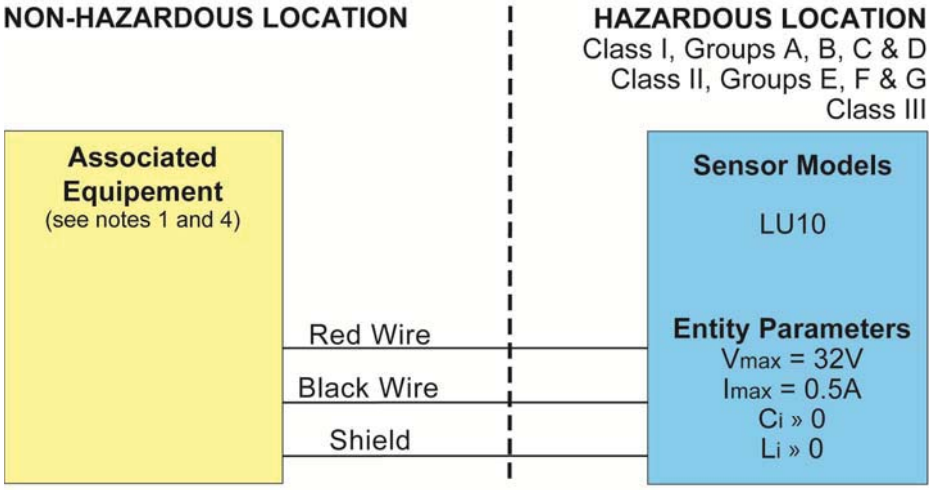


Sensor Power	*Relay Rating*
[RED & BLK wires] / 36 VDC Max. 5 ±1mA Dry / 22 ±1mA Wet	[GRN & WHT wires] / 60 VA

Models LU10-___5 Only: The LU10-___5 level switch has been approved for use in Class I, Groups A, B, C & D; UNDER CERTIFICATE NUMBER LR 79326-4. DO NOT USE THE LZ12, LP15 or LO10 SERIES IN INTRINSICALLY SAFE APPLICATIONS. The Entity parameter for the LU10-_ _ _5 are:

Vmax = 32 VDC / Imax = 0.5 A / Ci = 0 µF / Li = 0 mH

Intrinsically Safe Control Drawing:

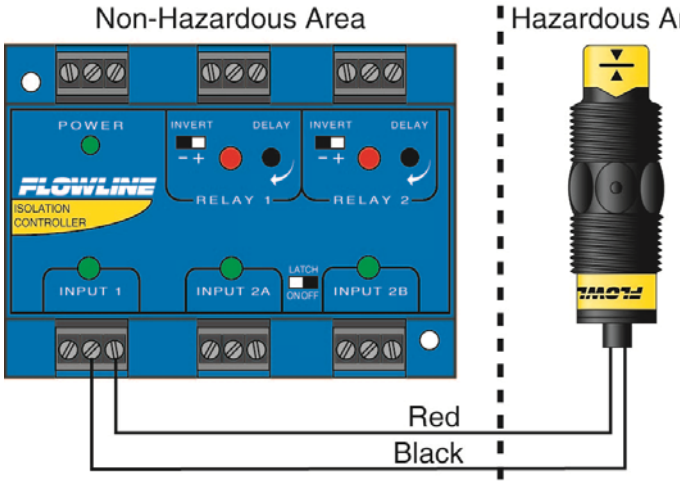


Notes:
1. CSA certified associated equipment with entity parameters.
2. $V_{max} \geq V_{oc}$, $I_{max} \geq I_{sc}$, $C_i + C_{cable} \leq C_a$., $L_i + L_{cable} \leq L_a$.
3. Installation should be in accordance with CEC Part I, or NFPA 70.
4. Associated equipment must be installed per manufacturers instructions

Sensor Drawing: LSD1
Rev. B 10-01-02

Wiring to a Flowline Controller: LC90 Series Controller (4 or 20 mA Signal Output)

LC90 Series
Entity Parameter
Voc = 17.47 VDC
Isc = 0.4597 A
Ca = 0.494 µF
La = 0.119 µH

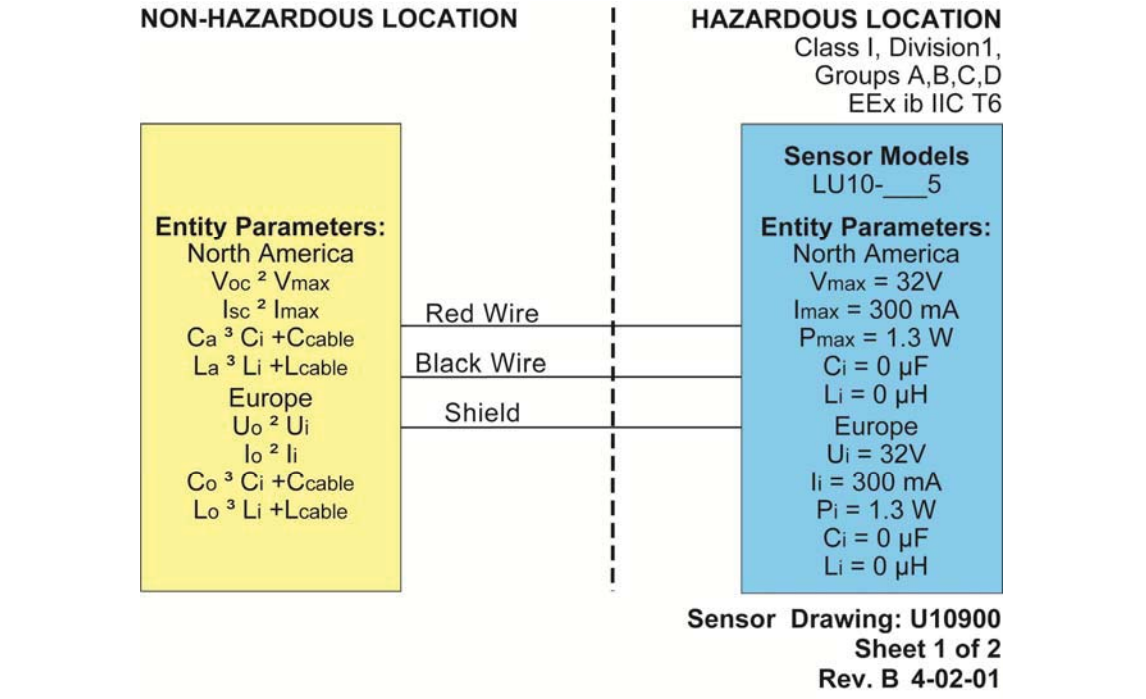


LU10 series
Entity Parameter
Vmax = 32 VDC
Imax = 0.5 A
Ci = 0 µF
Li = 0 µH

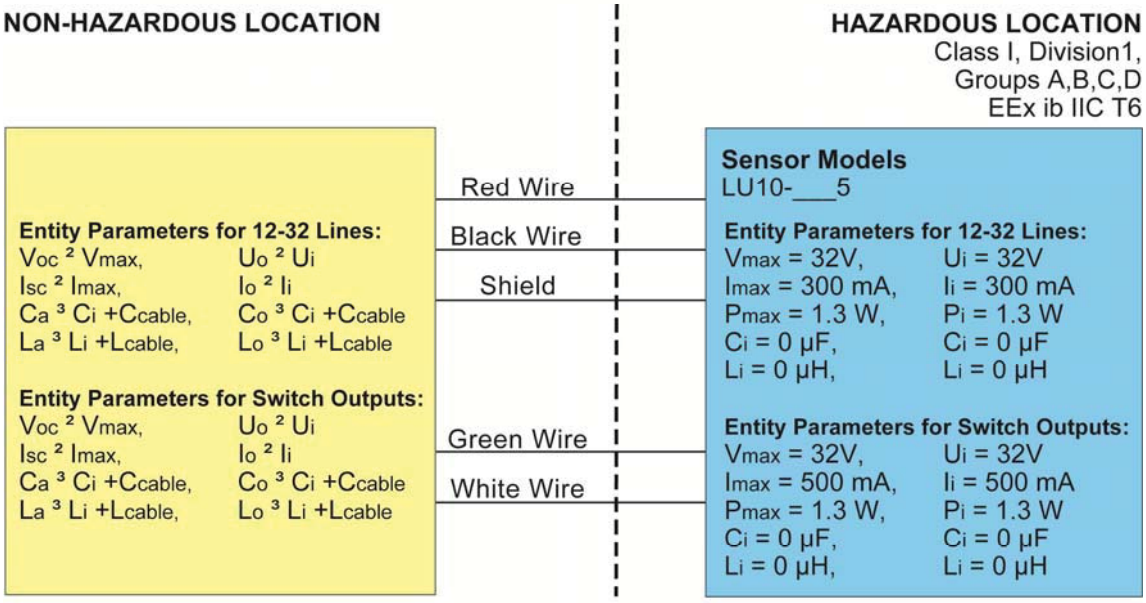
Models LU10-___5 Only: The LU10-___5 level switch has been approved for use in Class I, Division 1, Groups A, B, C & D; EEx ib IIC T6; UNDER CERTIFICATE NUMBER LCIE 01.E6048X. DO NOT USE THE LZ12, LP15 or LO10 SERIES IN INTRINSICALLY SAFE APPLICATIONS. The Entity parameter for the LU10-___5 are:

North America - Vmax = 32 VDC / Imax = 0.5 A / Pmax = 1.3 W / Ci = 0 µF / Li = 0 µH
Europe - Ui = 32 VDC / Ii = 0.5 A / Pi = 1.3 W / Ci = 0 µF / Li = 0 µH

Intrinsically Safe Control Drawing:



Sensor Drawing: U10900
Sheet 1 of 2
Rev. B 4-02-01

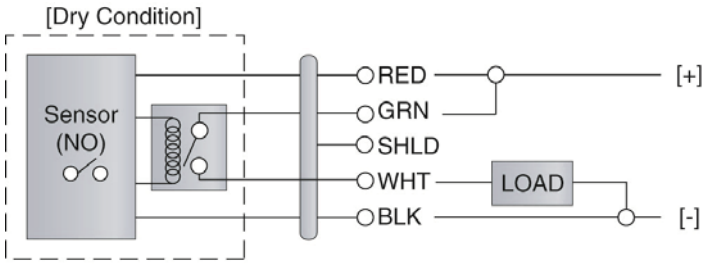


Notes: PARAMETERS DEPEND ON OUTPUT TYPE
1. Installation should be in accordance with CEC Part 1, or NFPA 70.
2. Associated Equipment shall be CSA certified with entity parameters connected in accordance with manufacturers instructions.

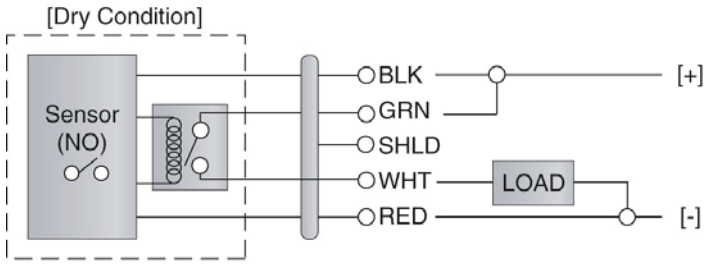
Sensor Drawing: U10900
Sheet 2 of 2
Rev. B 4-02-01

Wiring as a P-Channel or N-Channel output: The Switch-Tek™ can be substituted for either a P-Channel (PNP, sourcing) output or an N-Channel (NPN, sinking) output.

Normally Open DC Load as a P-Channel Output:
The Red wire connects to Positive (+) of the power supply and the Black wire connects to Negative (-). The Green wire is jumped to the Red wire while the White wire is connected to the LOAD. Jumper the LOAD to the Negative (-) to complete the circuit.

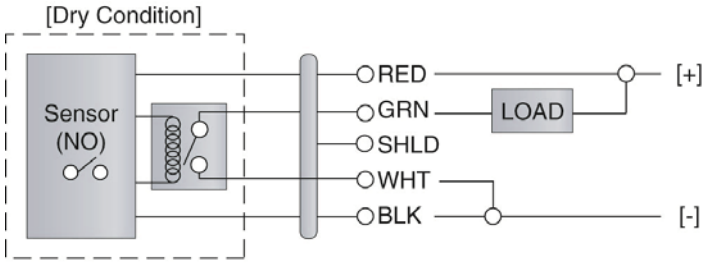


Normally Closed DC Load as a P-Channel Output:
The Black wire connects to Positive (+) of the power supply and the Red wire connects to Negative (-). The Green wire is jumped to the Black wire while the White wire is connected to the LOAD. Jumper the LOAD to the Negative (-) to complete the circuit.

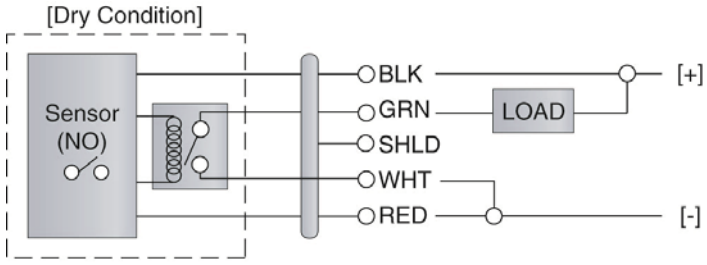


Sensor Power	*Relay Rating*
[RED & BLK wires] / 36 VDC Max. 5 ±1mA Dry / 22 ±1mA Wet	[GRN & WHT wires] / 60 VA

Normally Open DC Load as a N-Channel Output:
The Red wire connects to Positive (+) of the power supply and the Black wire connects to Negative (-). The White wire is jumped to the Black wire while the Green wire is connected to the LOAD. Jumper the LOAD to the Positive (+) to complete the circuit.



Normally Closed DC Load as a N-Channel Output:
The Black wire connects to Positive (+) of the power supply and the Red wire connects to Negative (-). The White wire is jumped to the Red wire while the White wire is connected to the LOAD. Jumper the LOAD to the Positive (+) to complete the circuit.



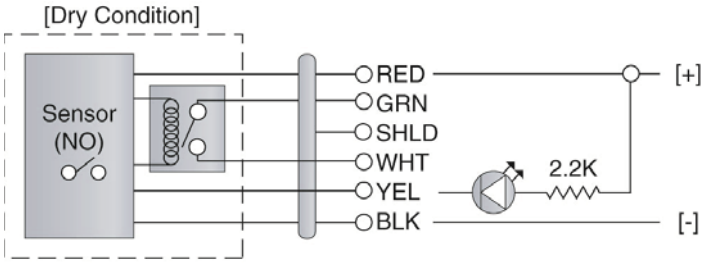
Sensor Power	*Relay Rating*
[RED & BLK wires] / 36 VDC Max. 5 ±1mA Dry / 22 ±1mA Wet	[GRN & WHT wires] / 60 VA

General: The Switch-Tek™ level switch requires no periodic maintenance except cleaning as required. It is the responsibility of the user to determine the appropriate maintenance schedule, based on the specific characteristics of the application liquids.

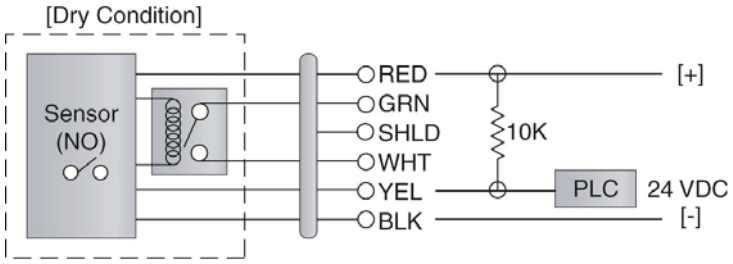
Cleaning procedure:

1. **Power:** Make sure that all power to the switch, controller and/or power supply is completely disconnected.
2. **Switch removal:** In all through-wall installations, make sure that the tank is drained well below the sensor prior to removal. Carefully, remove the sensor from the installation.
3. **Cleaning the switch:** Use a soft bristle brush and mild detergent, carefully wash the Switch-Tek™ level switch. Do not use harsh abrasives such as steel wool or sandpaper, which might damage the surface sensor. Do not use incompatible solvents which may damage the sensor's PP, PFA, PVDF or Ryton plastic body.
4. **Sensor installation:** Follow the appropriate steps of installation as outlined in the Installation section of this manual.

Maintenance Output to LED (LZ12 Only):
To wire the maintenance output wire to an LED, follow the wiring diagram below. The Yellow wire is connected to the LED and a 2.2kΩ resistor in series and referenced back to the (+) of the power supply.



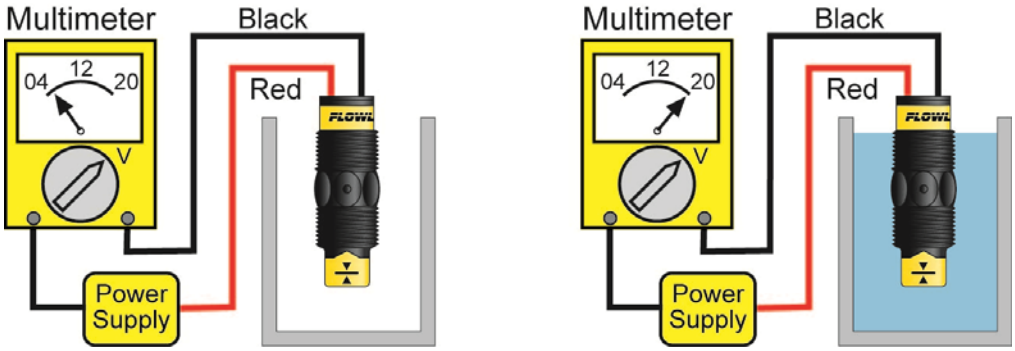
Maintenance Output to PLC (LZ12 Only):
To wire the maintenance output wire to a PLC, follow the wiring diagram below. The Yellow wire is connected to the PLC input with a 10 kΩ resistor parallel to the PLC input and the (+) of the power supply.



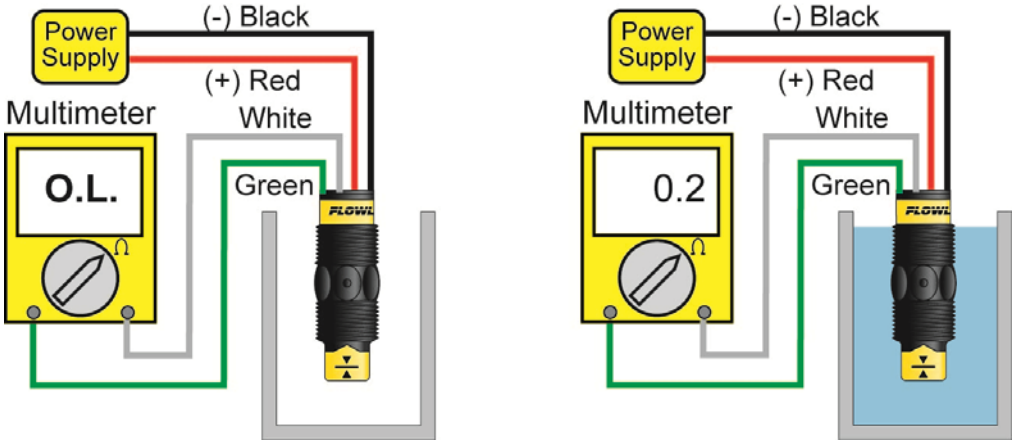
Sensor Power	*Relay Rating*	*Maintenance Alarm*
[RED & BLK wires] / 36 VDC Max. 5 ±1mA Dry / 22 ±1mA Wet	[GRN & WHT wires] / 60 VA	[YEL wire] / NPN Transistor / 10mA Max.

Testing the installation:

1. **Power:** Turn on power to the controller and/or power supply.
2. **Immersing the switch:** Immerse the sensing tip in its application liquid, by filling the tank up to the switches point of actuation. An alternate method of immersing the switch during preliminary testing is to hold a cup filled with application liquid up to the switch's tip.
3. **Test:** With the switch being fluctuated between wet and dry states, the switch indicator light in the controller should turn on and off. If the controller doesn't have an input indicator, use a voltmeter or ammeter to ensure that the switch produces the correct signal (see below).
4. **Point of actuation:** Observe the point at which the rising or falling fluid level causes the switch to change state, and adjust the installation of the switch if necessary.



Example: Testing the LU10 series with a Multimeter set to read current (mA). When wired NO [Red to (+)], the meter will read 5mA, ±1mA when dry and will read 20mA, ±1mA when wet.



Example: Testing the LU10 series with a multimeter set to read resistance (ohms). When wired NO [Red to (+)], the meter will read O.L when dry and will read some small amount of resistance (ex. 0.2 Ohms) when wet.

Warranty

Flowline warrants to the original purchaser of its products that such products will be free from defects in material and workmanship under normal use and service in accordance with instructions furnished by Flowline for a period of two years from the date of manufacture of such products. Flowline's obligation under this warranty is solely and exclusively limited to the repair or replacement, at Flowline's option, of the products or components, which Flowline's examination determines to its satisfaction to be defective in material or workmanship within the warranty period. Flowline must be notified pursuant to the instructions below of any claim under this warranty within thirty (30) days of any claimed lack of conformity of the product. Any product repaired under this warranty will be warranted only for the remainder of the original warranty period. Any product provided as a replacement under this warranty will be warranted for the full two years from the date of manufacture.

Returns

Products cannot be returned to Flowline without Flowline's prior authorization. To return a product that is thought to be defective, go to www.flowline.com, and submit a customer return (MRA) request form and follow the instructions therein. All warranty and non-warranty product returns to Flowline must be shipped prepaid and insured. Flowline will not be responsible for any products lost or damaged in shipment.

Limitations

This warranty does not apply to products which: 1) are beyond the warranty period or are products for which the original purchaser does not follow the warranty procedures outlined above; 2) have been subjected to electrical, mechanical or chemical damage due to improper, accidental or negligent use; 3) have been modified or altered; 4) anyone other than service personnel authorized by Flowline have attempted to repair; 5) have been involved in accidents or natural disasters; or 6) are damaged during return shipment to Flowline. Flowline reserves the right to unilaterally waive this warranty and dispose of any product returned to Flowline where: 1) there is evidence of a potentially hazardous material present with the product; or 2) the product has remained unclaimed at Flowline for more than 30 days after Flowline has dutifully requested disposition. This warranty contains the sole express warranty made by Flowline in connection with its products. ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY DISCLAIMED. The remedies of repair or replacement as stated above are the exclusive remedies for the breach of this warranty. IN NO EVENT SHALL FLOWLINE BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND INCLUDING PERSONAL OR REAL PROPERTY OR FOR INJURY TO ANY PERSON. THIS WARRANTY CONSTITUTES THE FINAL, COMPLETE AND EXCLUSIVE STATEMENT OF WARRANTY TERMS AND NO PERSON IS AUTHORIZED TO MAKE ANY OTHER WARRANTIES OR REPRESENTATIONS ON BEHALF OF FLOWLINE. This warranty will be interpreted pursuant to the laws of the State of California. If any portion of this warranty is held to be invalid or unenforceable for any reason, such finding will not invalidate any other provision of this warranty.

For complete product documentation, video training, and technical support, go to www.flowline.com.

For phone support, call 562-598-3015 from 8am to 5pm PST, Mon - Fri.

(Please make sure you have the Part and Serial number available.)

SCR-201/2 - Filter, Rotary screen, Newterra 17" wide SCR-50

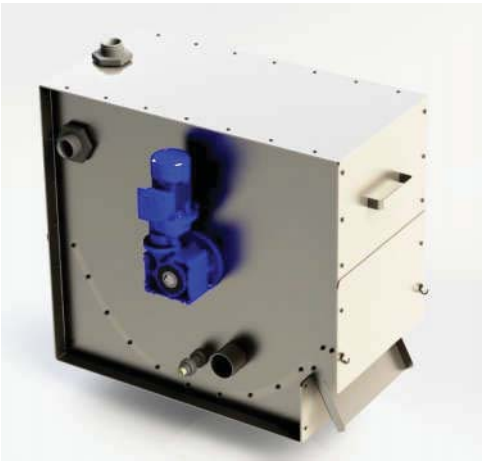
newterra
smart technology. sustainable solutions.

Waste Water Inlet Screens – SCR SERIES

newterra Inlet Screens are specifically designed to protect newterra MicroClear™ flat sheet membranes from fouling due to excessive debris from waste water plant influent. The SCR series is designed to complement the newterra small to medium size wastewater MBR plants. Typically the screens would be used at the inlet to the Equalization Basin or the Aeration Basin. The SCR units are rotating brush design with 0.5mm crossflow wedgewire screens, and are designed to minimize complexity while achieving superior performance.

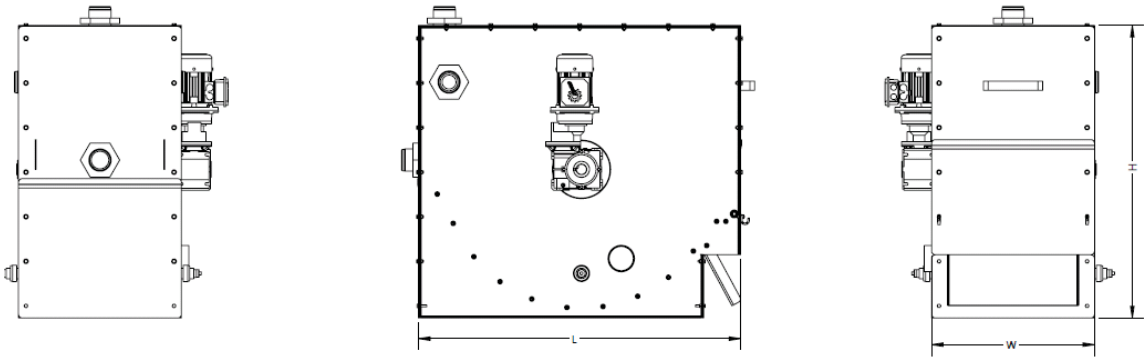
Standard Features:

- 304 SS construction
- 1/4 HP Gearbox/motor (waterproof aluminum)
- Easily replaceable heavy duty brushes
- Standard inlet on Top,Sides,Back
- Internal inlet baffling to provide full screen contact no matter which inlet is chosen
- Bag support
- High Level Switch Coupling
- Gravity Outlet
- Simple, reliable shear pin shaft/motor protection
- Can ship knocked down, easily assembled on site



Options:

- Stands
- Discharge Pump Tank
- Complete Packages c/w pumps and controls



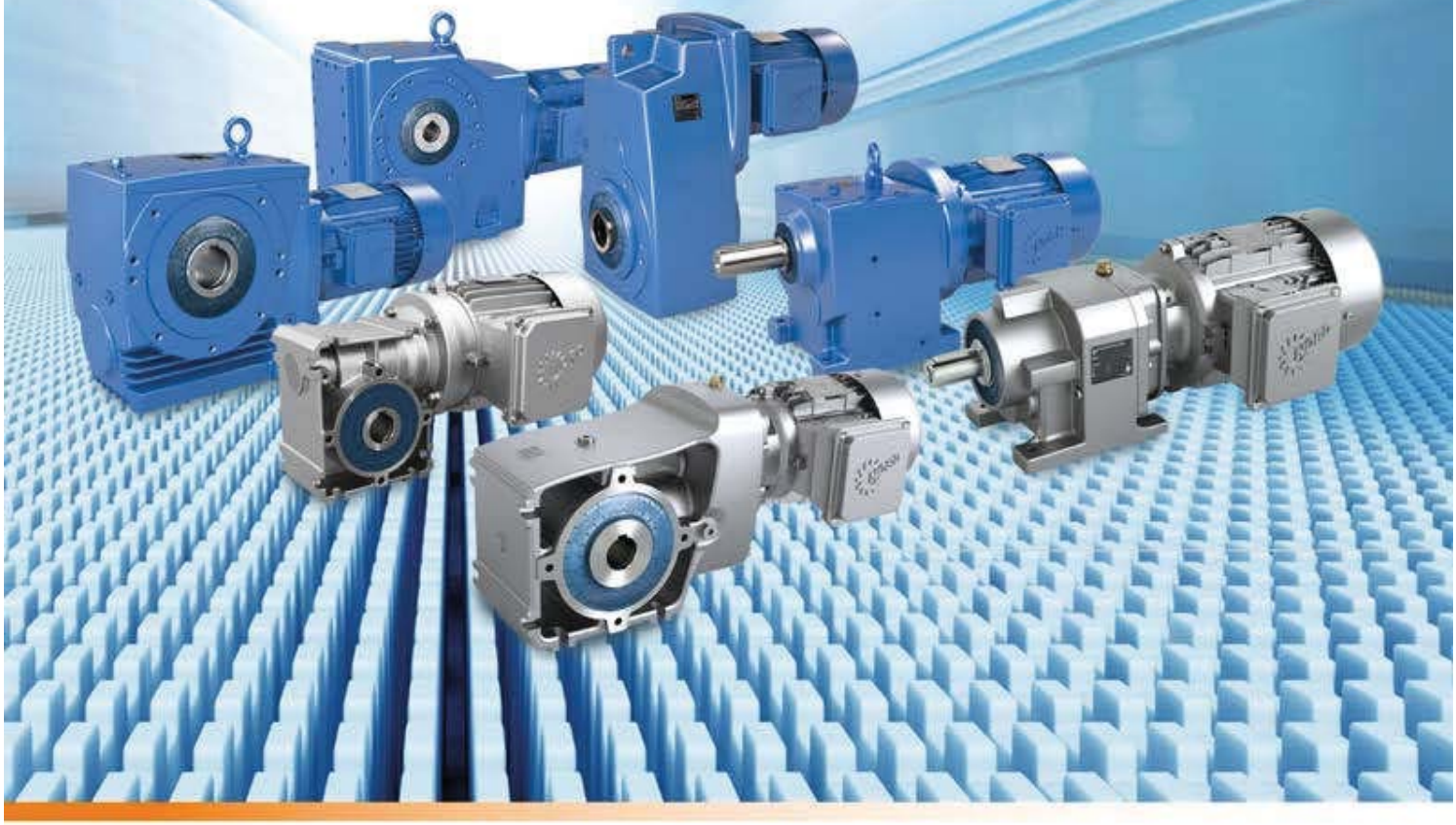
Dimension Chart:

Part Number	Width "W"	Standard Height "H"	Standard Overall Length "L"	Shipping Weight [lbs]	Inlet Size	Outlet Size	Nominal Flowrate gpm	Nominal Flowrate lps	Nominal Flowrate gpd	Nominal Flowrate m3/day
SCR-50	23"	39"	43"	150	2"	Open Bottom	50	3.2	72,000	273
SCR-100	41"	39"	43"	200	3"	Open Bottom	100	6.4	144,000	547

Nominal flowrates based on typical municipal characteristics

Intelligent Drivesystems, Worldwide Services

SCR-201/2 - Gear Motor, 230/460V 50/60 3P, 60/50hz 1/4hp
SK1SI63/H10-56C-63L/4 FRD DIV2 NSD+ 400:1
Nord Gear, 4.3 RPM, CSA CL1 DIV2"



EN

B 1000

Gear units

Operating and Assembly Instructions

NORD DRIVESYSTEMS

E-1278

General safety and operating instructions

1. General

Depending on its protection class, the device may have live, bare, moving or rotating parts or hot surfaces during operation,.

Unauthorised removal of covers, improper use, incorrect installation or operation causes a risk of serious personal injury or material damage.

All transport, installation, commissioning and maintenance work must be carried out by qualified specialist personnel (national accident prevention regulations must be observed).

Within the meaning of this basic safety information, qualified specialist personnel are persons who are familiar with the installation, assembly, commissioning and operation of the product and who have the training and experience to recognise and avoid any hazards and risks.

2. Correct use

NORD products may only be used according to the information in the catalogue and the associated technical documentation.

Compliance with the operating and installation instructions is a **prerequisite for fault-free operation** and for the fulfilment of any warranty claims. **These operating and installation instructions must be read** before working with the device!

These operating and installation instructions contain important information about **servicing**. They must therefore be kept **close to the device**.

All details regarding technical data and permissible conditions at the installation site must be complied with.

3. Transport, storage

Information regarding transport, storage and correct handling must be complied with.

4. Installation

The device must be protected against impermissible loads. In particular, during transport and handling, components must not be deformed or changed. Touching of electronic components and contacts must be avoided.

5. Electrical Connection

When working on live three-phase motors, the applicable national accident prevention regulations must be complied with (e.g. BGV A3, formerly VBG 4).

The electrical installation must be implemented according to the applicable regulations (e.g. cable cross-section, fuses, earth lead connections).

Information regarding EMC-compliant installation – such as shielding, earthing and installation of cables – can be found in the three-phase motor documentation. Compliance with the limiting values specified in the EMC regulations is the responsibility of the manufacturer of the system or machine.

6. Operation

Appropriate safety measures must be taken for applications where failure of the device may result in injury.

Where necessary, systems in which NORD devices are installed must be equipped with additional monitoring and protective equipment according to the applicable safety requirements, e.g. legislation concerning technical equipment, accident prevention regulations, etc.

All covers and guards must be kept closed during operation.

7. Maintenance and repairs

After the device has been disconnected from the power supply, live equipment components and power connections should not be touched immediately, because of possible charged capacitors.

Further information can be found in this documentation.

These safety instructions must be kept in a safe place!

Documentation

Name:	B 1000
Part No.:	6052802
Series:	Gear units and geared motors
Type series:	
Gear unit types:	**Helical gear unit** **NORDBLOC helical gear units** **Standard helical gear units** **Parallel shaft gear units** **Bevel gear units** **Helical worm gear units** **MINIBLOC worm gear units** **UNIVERSAL worm gear units**

Version list

Title, Date	Order number	Comments
B 1000, February 2013	6052802 / 0713	-
B 1000, September 2014	6052802 / 3814	General corrections
B 1000, April 2015	6052802 / 1915	New gear unit types SK 10382.1 + SK 11382.1
B 1000, March 2016	6052802 / 0916	General corrections New bevel gear units SK 920072.1 + SK 930072.1
B 1000, September 2016	6052802 / 3816	General corrections New SK 071.1 helical gear unit, SK 171.1, SK 371.1, SK 571.1, SK 771.1;

Table 1: Version list B 1000

Copyright notice

Publisher

Getriebebau NORD GmbH & Co. KG
Getriebebau-Nord-Straße 1 • 22941 Bargteheide, Germany • http://www.nord.com/
Fon +49 (0) 45 32 / 289-0 • Fax +49 (0) 45 32 / 289-2253

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List of illustrations

List of tables

1 Notes

1.1 General information

Read the Operating Manual carefully prior to performing any work on or putting the gear unit into operation. Strict compliance with the instructions in this Operating Manual is essential. This Operating Manual and all associated special documentation must be kept in the immediate vicinity of the gear unit.

Getriebebau NORD accepts no liability for damage to persons, materials or assets as a result of the non-observance of this Operating Manual, operating errors or incorrect use. General wearing parts, e.g. radial seals are excluded from the warranty.

If additional components are attached to or installed on or in the gear unit (e.g. motor, cooling system, pressure sensor etc.) or components (e.g. cooling system) are supplied with the order, the operating instructions for these components must be observed.

If geared motors are used, compliance with the Motor Operating Manual is also necessary.

If you do not understand the contents of this Operating Manual or additional operating instructions, please consult Getriebebau NORD!

1.2 Safety and information symbols

1.2.1 Explanation of labels used

DANGER	Indicates an immediate danger, which may result in death or serious injury.
WARNING	Indicates a possibly dangerous situation, which may result in death or serious injury.
CAUTION	Indicates a possibly dangerous situation, which may result in slight or minor injuries.
NOTICE	Indicates a possibly harmful situation, which may cause damage to the product or the environment.
Note	Indicates hints for use and useful information.

1.3 Correct use

These gear units generate a rotational movement and are intended for use in commercial systems. The gear unit must only be used according to the information in the technical documentation from Getriebebau NORD.

Commissioning (start of proper operation) is prohibited until it has been established that the machine complies with the local laws and directives. The EMC Directive 2004/108/EC and the Machinery Directive 2006/42/EC in their currently valid scope of application must be complied with in particular.

DANGER! — **Explosion hazard**

Serious injury and material damage due to explosion are possible.

Use in explosion hazard areas is prohibited.

WARNING — **Injury to persons**

Appropriate safety measures must be taken for applications where failure of a gear unit or geared motor may result in injury.

Safeguard a wide area around the hazard zone.

WARNING — **Material damage and personal injury**

If the gear unit is not used as designed, this may cause damage to the gear unit or the premature failure of components. Personal injury as a result of this cannot be ruled out.

Strict compliance with the technical data on the type plate is essential. The documentation must be observed.

1.4 Safety information

Observe all safety information, including that provided in the individual sections of this Operating Manual. All national and other regulations on safety and accident prevention must also be observed.

DANGER! **Severe personal injury**

Serious physical and property damage may result from inappropriate installation, non-designated use, incorrect operation, non-compliance with safety information, unauthorised removal of housing components or safety covers and structural modifications to the gear unit.

- All work, e.g. transportation, storage, installation, electrical connection, commissioning, servicing, maintenance and repair must only be performed by qualified specialist personnel.
- Observe the Operating Manual
- Observe the safety information
- Observe the safety and accident prevention regulations.
- Tighten the drive elements or secure the parallel key before switching on.
- Do not make any structural modifications.
- Do not remove any safety devices.
- If necessary, wear hearing protection when working in the immediate vicinity of the gear unit.
- All rotating components must be provided with guards. In standard cases, covers are fitted by NORD . The covers must always be used if contact protection is not provided by other methods.

DANGER! **Injury to persons**

The surfaces of gear units or geared motors may become hot during or shortly after operation. Danger of burns!

- Installation and maintenance work must only be performed when gear unit is at a standstill and has cooled down. The drive must be isolated and secured to prevent accidental start-up.
- Wear protective gloves.
- Shield hot surfaces with contact guards.
- Do not store inflammable objects or substances in the immediate vicinity of the gear unit.

WARNING **Injury to persons**

Serious injury and material damage due to improper transport are possible.

- No additional loads may be attached.
- Transportation aids and lifting gear must have an adequate load-bearing capacity.
- Pipes and hoses must be protected from damage.

⚠ CAUTION **Injury to persons**

Danger of cuts from exterior edges of attachment adapters, flanges and covers.

Contact freezing with metallic components in case of low temperatures.

In addition to personal protective equipment, wear suitable protective gloves and suitable goggles during assembly, commissioning, inspection and maintenance, in order to prevent injuries.

It is recommended that repairs to NORD Products are carried out by the NORD Service department.

1.5 Other documents

Further information may be obtained from the following documents:

- Gear unit catalogues (G1000, G1012, G1014, G1035, G1050, G2000),
- Operating and maintenance instructions for the electric motor,
- if applicable, the Operating Manuals for attached or supplied options

1.6 Disposal

Observe the current local regulations. In particular, lubricants must be collected and disposed of correctly.

Gear unit components	Material
Gear wheels, shafts, rolling bearings, parallel keys, locking rings, …	Steel
Gear unit housing, housing components, …	Grey cast iron
Light alloy gear unit housing, light alloy gear unit housing components, …	Aluminium
Worm gears, bushes, ...	Bronze
Radial seals, sealing caps, rubber components,…	Elastomers with steel
Coupling components	Plastic with steel
Flat seals	Asbestos-free sealing material
Gear oil	Additive mineral oil
Synthetic gear oil (type plate code: CLP PG)	Polyglycol-based lubricants
Cooling spiral, embedding material of the cooling spiral, screw fittings	Copper, epoxy, yellow brass

Table 2: Disposal of materials

2 Description of gear unit

2.1 Type designations and gear unit types

Gear unit types / Type designations
Helical gear units
SK 11E, SK 21E, SK 31E,SK 41E, SK 51E (1-stage)
SK 02, SK 12, SK 22, SK 32, SK 42, SK 52, SK 62N (2-stage)
SK 03, SK 13, SK 23, SK 33N, SK 43, SK 53 (3-stage)
SK 62, SK 72, SK 82, SK 92, SK 102 (2-stage)
SK 63, SK 73, SK 83, SK 93, SK 103 (3-stage)
NORDBLOC helical gear units
SK 320, SK 172, SK 272, SK 372, SK 472, SK 572, SK 672, SK 772, SK 872, SK 972 (2-stage)
SK 273, SK 373, SK 473, SK 573, SK 673, SK 773, SK 873, SK 973 (3-stage)
SK 071.1, SK 371.1, SK 571.1, SK 771.1 (1-stage)
SK 072.1, SK 172.1, SK 372.1, SK 572.1, SK 672.1, SK 772.1, SK 872.1, SK 972.1 (2-stage)
SK 373.1, SK 573.1, SK 673.1, SK 773.1, SK 873.1, SK 973.1 (3-stage)
Standard helical gear units
SK 0, SK 01, SK 20, SK 25, SK 30, SK 33 (2-stage)
SK 10, SK 200, SK 250, SK 300, SK 330 (3-stage)
Parallel shaft gear unit
SK 0182NB, SK 0282NB, SK 1282, SK 2282, SK 3282, SK 4282, SK 5282, SK 6282, SK 7282, SK 8282, SK 9282, SK 10282, SK 11282 (2-stage)
SK 1382NB, SK 2382, SK 3382, SK 4382, SK 5382, SK 6382, SK 7382, SK 8382, SK 9382, SK 10382, SK 10382.1, SK 11382, SK 11382.1, SK 12382 (3-stage)
Bevel gear units
SK 92072, SK 92172, SK 92372, SK 92672, SK 92772; SK 920072.1, SK 92072.1, SK 92172.1, SK 92372.1, SK 92672.1, SK 92772.1, SK 93072.1, SK 93172.1, SK 930072.1, SK 93372.1, SK 93672.1, SK 93772.1 (2-stage)
SK 9012.1, SK 9016.1, SK 9022.1, SK 9032.1, SK 9042.1, SK 9052.1, SK 9062.1, SK 9072.1, SK 9082.1, SK 9086.1, SK 9092.1, SK 9096.1 (3-stage)
SK 9013.1, SK 9017.1, SK 9023.1, SK 9033.1, SK 9043.1, SK 9053.1 (4-stage)
Helical worm gear units
SK 02040, SK 02050, SK 12063, SK 12080, SK 32100, SK 42125 (2-stage)
SK 13050, SK 13063, SK 13080, SK 33100, SK 43125 (3-stage)
MINIBLOC worm gear units
SK1 S32, SK1 S40, SK 1S50, SK 1S63, SK 1SU..., SK 1SM31, SK 1SM40, SK 1SM50, SK 1SM63 (1-stage)
SK 2S32NB, SK 2S40NB, SK 2S50NB, SK 2S63NB, SK 2SU…, SK 2SM40, SK 2SM50, SK 2SM63 (2-stage)

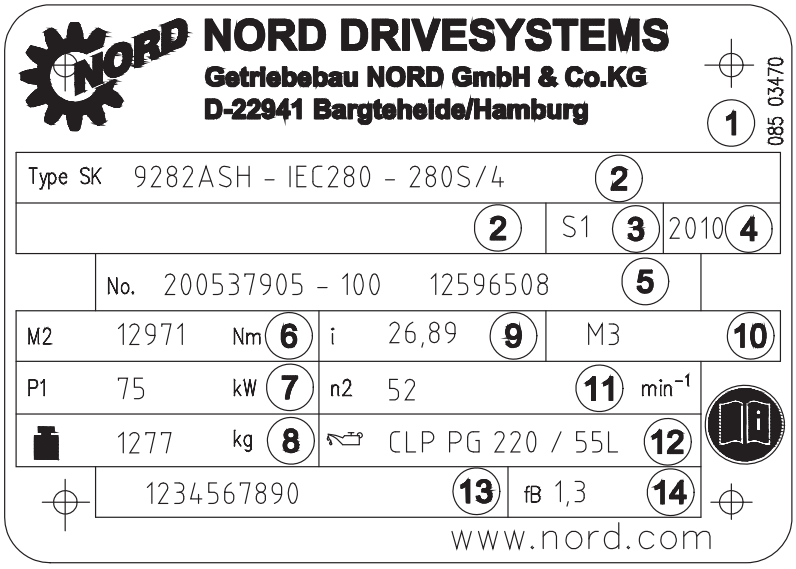
Gear unit types / Type designations					
UNIVERSAL worm gear units SK 1SI31, SK 1SI40, SK 1SI50, SK 1SI63, SK 1SI75, SK 1SIS31, …, SK 1SIS75, SK 1SID31, …, SK 1SID63, SK 1SMI31, …, SK 1SMI75, SK 1SMID31, …, SK 1SMID63, SK 1SIS-D31, …, SK 1SIS-D63 (1-stage), SK 2SMID40, SK 2SMID50, SK 2SMID63, SK 2SID40, …, SK 2SID63 (2-stage)					
Versions / Options					
-	Foot mounting with solid shaft	D	Torque support	IEC	Standard IEC motor mounting
A	Hollow shaft version	K	Torque bracket	NEMA	Standard NEMA motor attachment
V	Solid shaft version	S	Shrink disc	W	With free drive shaft
L	Solid shaft both sides	VS	Reinforced shrink disc	VI	Viton radial seals
Z	Output flange B14	EA	Hollow shaft with internal spline	OA	Oil expansion tank
F	Output flange B5	G	Rubber buffer	OT	Oil level tank
X	Foot mounting	VG	Reinforced rubber buffer	SO1	Synthetic oil ISO VG 220
XZ	Base and output flange B14	R	Back stop	CC	Casing cover with cooling spiral
XF	Base and output flange B5	B	Fastening element	DR	Pressure venting
AL	Reinforced axial output bearings	H	Covering cap as contact guard	H10	Modular contrate pre-stage
5	Reinforced output shaft (Standard helical gear units)	H66	Covering cap IP66	/31	Worm pre-stage
V	Reinforced drive shaft (Standard helical gear units)	VL	Reinforced bearings	/40	Worm pre-stage
		VL2	Agitator version		
		VL3	Drywell agitator version		

Table 3: Type designations and gear unit types

Double gear units consist of two single gear units. They are to be treated as per the instructions in this Manual, i.e. as two individual gear units.

Type designation for double gear units: e.g. SK 73 /22 (consisting of single gear units SK 73 and SK 22)

2.2 Type plate



	Explanation
1	Matrix or bar code
2	NORD gear unit type
3	Operating mode
4	Year of manufacture
5	Serial number
6	Rated torque of gear unit output shaft
7	Drive power
8	Weight according to ordered version
9	Overall gear unit ratio
10	Installation orientation
11	Rated speed of gear unit output shaft
12	Lubricant type, viscosity and quantity
13	Customer's part number
14	Operating factor

Fig. 1: Type plate (example) with explanation of the type plate fields

3 Assembly instructions, storage, preparation, installation

Please observe all general safety instructions (please see chapter 1.4 "Safety information"), the safety information in the individual sections and the proper use (please see chapter 1.3 "Correct use")bestimmungsgemäße Verwendung</dg_ref_source_inline>.

3.1 Transporting the gear unit

WARNING — **Hazard due to heavy loads**

Severe injuries and material damage due to falling or tipping heavy loads are possible.

- Standing under the gear unit during transport is **extremely dangerous**.
- To prevent injury, **the danger area must be generously cordoned off.**
- Only transport using the eyebolts attached to the gear unit.
- No additional loads may be attached.
- If geared motors have an additional eyebolt attached to the motor, this must also be used.
- The thread of the eyebolt must be fully screwed in.
- Avoid pulling the eyebolts at an angle.

NOTICE — **Gear unit damage**

Damage to the gear unit due to improper use is possible.

- Prevent damage to the gear unit. Impacts to the free ends of the shafts may cause internal damage to the gear unit.
- Use adequately dimensioned and **suitable means of transportation**. Lifting tackle must be designed for the weight of the gear unit. The weight of the gear unit can be obtained from the dispatch documents.

3.2 Storage

For short-term storage before commissioning, please observe the following:

Store in the installation position (please see chapter 6.1 "Configurations and maintenance") and secure the gear unit against falling,

- Lightly oil bare metal housing surfaces and shafts
- Store in a dry place.
- Temperature in the range from – 5 °C to + 50 °C without large fluctuations,
- Relative humidity less than 60 %,
- No direct exposure to sunlight or UV light,
- No aggressive, corrosive substances (contaminated air, ozone, gases, solvents, acids, alkalis, salts, radioactivity etc.) in the immediate vicinity,
- No vibration or oscillation

3.3 Long-term storage

CAUTION — **Injury to persons**

Incorrect, or excessively long storage may result in malfunctions of the gear unit.

Perform an inspection of the gear unit prior to commissioning if the permissible storage time has been exceeded.

Information — **Long-term storage**

For storage or standstill periods in excess of 9 months, Getriebebau NORD recommends the long-term storage option.

With the long-term storage option and the use of the measures listed below, storage for up to 2 years is possible. As the actual influences on the unit greatly depend on the local conditions, these times should only be regarded as guide values.

Conditions of the gear unit and storage area for long-term storage prior to commissioning:

- Store in the installation position (please see chapter 6.1 "Configurations and maintenance") and secure the gear unit against falling.
- Transportation damage to the external paint must be repaired. Check that a suitable rust inhibitor is applied to the flange bearing surfaces. If necessary apply a suitable rust inhibitor to the surfaces.
- Gear units with the long-term storage option are completely filled with lubricant or have VCI corrosion protection agent mixed with the gear oil (see adhesive label on the gear unit, or are not filled with oil, but rather with small quantities of VCI concentrate.
- The sealing band in the vent plug must not be removed during storage. The gear unit must remain sealed tight.
- Store in a dry place.
- In tropical regions, the gear unit must be protected against damage by insects
- Temperature in the range from – 5 °C to + 40 °C without large fluctuations,
- Relative humidity less than 60 %,
- No direct exposure to sunlight or UV light,
- No aggressive, corrosive substances (contaminated air, ozone, gases, solvents, acids, alkalis, salts, radioactivity etc.) in the immediate vicinity,
- No vibration or oscillation

Measures during storage or standstill periods

- If the relative humidity is <50 % the gear unit can be stored for up to 3 years.

Measures before commissioning

- If the storage or standstill period exceeds 2 years or the temperature during short-term storage has greatly deviated from the standard range, the lubricant in the gear unit must be replaced before commissioning.
- If the gear unit is completely filled, the oil level must be reduced before commissioning.
- For gear units without oil filling, the oil level for the version must be filled before commissioning. The VCI concentrate may remain in the gear unit. Lubricant quantities and types must be filled according to the details on the type plate.

3.4 Preparing for installation

⚠ CAUTION — **Injury to persons**

Transport damage may cause malfunctions of the gear unit, which may cause material damage or personal injury.

Please inspect the delivery for transport and packaging damage immediately on receipt. Report any damage to the carrier immediately. Gear units with transport damage must not be commissioned.

The drive unit must be inspected and may only be installed if no damage is apparent. In particular the radial seals and the sealing caps must be inspected for damage.

Pay attention to leaked lubricants, they may cause slips.

All bare metal surfaces and shafts of the gear unit are protected against corrosion with oil, grease or corrosion protection agents before shipping.

Thoroughly remove all oil, grease or corrosion protection agents and any dirt from the shafts and flange surfaces before assembly.

In applications where an incorrect rotational direction may result in damage or potential risk, the correct rotational direction of the output shaft is to be established by test running the drive when uncoupled and guaranteeing such for subsequent operation.

Gears with integrated return stops are marked with arrows on the drive/driven sides. The arrows point in the rotation direction of the gear unit. When connecting the motor and during motor control, it must be ensured that the gear unit can only operate in the direction of rotation. (For further explanations see catalogue G1000 and WN 0-000 40)

NOTICE — **Gear unit damage**

For gear units with an integrated back stop, switching the drive motor to the blocked direction of rotation, i.e. incorrect direction of rotation, may result in damage to the gear unit.

Take care that the direction of rotation is correct.

Ensure that no aggressive or corrosive substances are present in the area surrounding the installation site or are subsequently expected during operation, which attack metal, lubricants or elastomers. In case of doubt, please contact Getriebebau NORD and take the recommended action.

Oil expansion tanks (Option OA) must be fitted in accordance with works standard WN 0-530 04. For gear units with an M10x1 vent plug, works standard WN 0-52135 must be also be observed during installation.

Oil level tanks (Option OT) must be fitted in accordance with works standard WN 0-521 30.

If venting of the gear unit is provided, the vent or the pressure vent must be activated before commissioning. To activate, remove the transport securing device (sealing cord). Position of the vent plug (please see chapter 6.1 "Configurations and maintenance").