



NK KTV KTVE KTZ
KRS GPN NKZ LH
GH



Starting and operating instruction (GB).....	2
Inbetriebnahme- und Betriebsanleitung (D).....	6
Instructions de démarrage et d'utilisation (F).....	10
Istruzioni di avviamento e funzionamento (I).....	14
Puesta en marcha e instrucciones de funcionamiento (ES)....	18
Manual de Instruções e Funcionamento (P)	22
Οδηγίες εκκίνησης και λειτουργίας (GR).....	26
Pompayı start etme ve kullanma talimatı (TR).....	30
Start- en bedrijfstellingsaanwijzingen (NL).....	34
Drifts- og vedlikeholdsinstruksjon (N).....	38
Instruktioner vedrørende opstart og drift (DK).....	42
Start- och driftsinstruktioner (SW).....	46
Käynnistys - ja käyttöohjeet (FL)	50
Palaišanas un Apkalpošanas Instrukcija (LV).....	54
Käivitamine ja käitamise juhend (EE).....	58
Instrukcja Instalowania I Użytkowania (PL).....	62
Üzembehelyezési- és üzemeltetési utasítás (HU).....	66

Thank you for having selected a Tsurumi submersible pump. For full benefit of this equipment, you should read, before use, the following points which are necessary for safety and reliability anyway. The table of contents guides you to the respective warnings and instructions.

Contents

Applications.....	2	Service and Maintenance.....	4
Product Description.....	2	Trouble Shooting.....	5
Handling and Storage.....	2	Technical Data.....	see appendix
Installation.....	2		
Electrical Connections.....	3		
Operation.....	3		

Applications

These instructions apply to the submersible pumps specified on the cover. They are intended for use with periodic maintenance, under conditions approved by a competent installation technician, in water of up to 40°C, with solids or nonflammable liquids compatible with cast iron, nitrile rubber and the other materials, without the mixture exceeding a viscosity of 10 cp (m pa·s). During use, discharge conduit and cabling should be touched only if need be, and the water absolutely not. The area should be accessible to competent maintenance technicians only, to the absolute exclusion of children and the general public. The pumps conform to the relevant directives of the EU.



CAUTION!

The pump must not be run if it has been partially dismantled

To avoid motor overload, the following content of sand or stony matter in water, and the following density, should not be exceeded (data of other types upon request):

maximum	continuously		intermittently	
	g/litre	density	g/litre	density
KTV, KTZ, NK, KRS, LH, LH-W, GH-311W	10	1,02	20	1,05
KTV2-50	40	1,1	60	1,15
KTV2-80	80	1,2	100	1,25
KRS2-80/100/150	100	1,25	120	1,3



CAUTION!

The pump must not be permanently installed in swimming pools or fountains if the installation area can be flooded.

DANGER!

The pump must not be used in an explosive or flammable environment or for pumping flammable liquids.

Product Description

See table for technical data; see definitions of the icons used, below. Individual performance graphs, dimension diagrams and any other data wanted for proper selection and installation will be gladly provided upon request by the local Tsurumi agent.

The significance of the text in the table (appendix) is as follows:

	=Speed of rotation		=Electric cable
	=Oil volume		=Mechanical seal
	=Immersion depth (maximum)		=Dry weight (without cable)

$\boxed{1\ 2\ 3}$ =Dimensions

I_{\emptyset} =Rated current

I_{max} =Starting current

H_{max} =max. head

P_2 =Rated power

P_1 =Power input

Q_{max} =max. flow rate

=connection to terminal board (diagram in appendix)

The pumps should not be used in an atmosphere that could become explosive nor in water that might contain traces of flammable liquid.

Handling and Storage

The pump can be transported and stored either vertically or horizontally. Make sure that it is securely lashed and cannot roll.



CAUTION!

Always lift the pump by the lifting handle - never by the motor cable or hose.

The time between delivery and the first hour of pumping is extremely hazardous. Care need be taken not to crush, kink or pull the fragile cable and not to break the hard but brittle cast iron or endanger a bystander. No water should enter the open end of the cable during handling.



CAUTION!

The pump must always rest on a firm surface so that it will not overturn. This applies to all handling, transport, testing and installation.

Store in a dry place to avoid corrosion by damp air inside the pump. The pump should first be rinsed if a corrosive mixture has been pumped. Rinsing with water mixed with cutting oil can be of some help if no dry storage is available.

Installation



CAUTION!

The lifting tackle must always be designed to suit the pump weight. See under the heading "Product description".

Installation:

If the pressure at the pump outlet is very low, say less than 1 bar, 1kg/cm² or 10 m H₂O (water column), layflat hose is used nearly exclusively. Folds in the hose can reduce or stop the flow from the pump. Using spiral reinforced hose at least for the first 5m or so and to go over a possible wall or edge, is an improvement, even for higher pressures. Better to use layflat hose only in straight lengths.

If the pressure at the pump outlet is high and/or hose diameter large, loosening or rupture of a hose can result in violent movement or flooding. With large hoses (8" to 12"), the weight of water, stiffening when (even under slight) pressure and axial force of the water combine to make for unreliability unless expert attention is given to selection and erection. Rigid lightweight quick-couple piping and bends, available on the market up to 12", lessen the risk.

Safety measures

In order to reduce the risk of accidents during service and installation work, take extreme care and bear in mind the risk of electrical accidents.

Only a competent electrician should be allowed to work on the electrical circuit, since only he knows the dangers involved and the regulations.

Do not connect the power supply if any part of the pump or its installation has not been completed and inspected, or if anyone is touching the water.

Lifting:

Every pump needs a stout lifting rope. Its end must remain accessible under all circumstances.

Cable:

The cable and its possible watertight connection and extension cable must reach to a level beyond reach of flooding. An electrician can extend a cable and make the splice waterproof, if he is experienced and has the proper 3M or equivalent kit. Replacement of the cable, in a workshop only, is always preferable. Voltage loss due to underrated cabling between power source and pump, is by far the most common cause of motor overload.

Only a competent electrician should be allowed to work on the electrical circuit, since only he knows the dangers involved and the regulations to be followed.

Before switching on:

Do not connect the power supply if any part of the pump or its installation has not been completed and inspected, or if anyone is touching the water.

Two additional hazards for the cable are snagging whilst the pump is being lowered, and crushing by vehicle tires or tracks. Transport is also a potential source of damage.

Electrical Connections

The pump must be connected to terminals or starting equipment installed at a level at which it cannot be flooded.

All electrical work must be carried out by an authorized electrician.

Only open a motor at a workshop. All measurements must be made at the free end of the cable.



CAUTION!

All electrical equipment must always be earthed (grounded), this applies both to the pump and to any monitoring equipment.

Improper wiring can lead to current leakage, electrical shock or fire. Be sure to use a ground leakage breaker and an overcurrent protector (or breaker) to prevent damage to the pump that may lead to electrical shock. Imperfect grounding can cause the pump to be put out of operation by electro-galvanic corrosion very quickly.



CAUTION!

Before connecting the cable to the terminal board, make sure that the power supply (i.e. circuit breaker) is properly disconnected. Failure to do so may lead to electrical shock, short, or injury caused by the unintended starting of the pump.



CAUTION!

The electrical installations must conform to national and local regulations.



CAUTION!

If a cable is damaged, it must always be replaced.

For connecting the cables correctly to the terminal board please keep to the diagram indicated in the table in the appendix

Check that the mains voltage, frequency, starting equipment and method agree with the particulars stamped on the motor rating plate.

Rated Frequency must be within $\pm 1\text{Hz}$, and rated voltage within $\pm 5\%$, of the power supply actual values. Check that the thermal overload relays are set to the pump's rated ampere draw and that they are correctly connected.

Connection of stator and motor conductors

If the pump is not fitted with a connector, please contact your Tsurumi dealer.

To enable the correct connections to be made, the number of conductors, any monitoring equipment and the method of starting (see name plate) must be known.

Cabletyre cable

If one or more extension cables are used, they may need to be of larger section than the pump cable, according to length and possible other loads. A cable of insufficient section results in loss of voltage and hence overheating of motor and cable, which may lead to repeated motor stoppage, unreliability, shortcircuit, fire, current leakage and electric shock. So does a damaged or unsecurely wired cable, the more so if it is submerged. No attempt should be made to replace or splice the pump cable, or open the motor, outside of a suitably manned workshop. Always protect the cable against pulling, crushing, grazing and kinking, as the copper conductors are fragile and must remain insulated to avoid lack of voltage, shortcircuiting or electric shock. Apply no load to a cable that is lying in a roll, as a peak voltage can result, high enough to burn through the insulation.

Operation

Before Starting:

Check that all persons concerned agree that all verifications have been completed. Check that all bolts are tight and the pump's weight is supported, the discharge conduit has been connected up, nobody is touching the water nor is unnecessarily near the conduit or switchgear. Be prepared to stop at once.



CAUTION!

The starting jerk may be violent. Don't hold the pump handle when checking the direction of rotation.

Make sure that the pump is firmly supported and cannot rotate.

The pump will jerk anti-clockwise when viewed from above, indicating that it is running clockwise. If not, two of the three phases U, V, W should be transposed with care by an electrician at the point of connection of pump cable to starter.

In the case of star delta please ask your Tsurumi dealer.



CAUTION!

Reversal of the direction of rotation on a plug that has no phase transposing device may be done only by an authorized person.



CAUTION!

If the built-in motor protection has tripped, the pump will stop but will restart automatically when it has cooled down. NEVER open the motor to make measurements, this can be done at the free end of the cable.



WARNING!

Never insert your hand or any other object into the inlet opening on the underside of the pump casing when the pump is connected to the power supply.

Before inspecting the pump casing, check that the pump has been isolated from the power supply and cannot be energized.

Service and Maintenance



CAUTION!

Before any work is started, check that the pump is isolated from the power supply and cannot be energized.

Remove any debris attached to the pump's outer surface, and wash the pump with tap water. Pay particular attention to the impeller area, and completely remove any debris from the impeller.

Verify that the paint is not peeling, that there is no damage, and that the bolts and nuts have not loosened. If the paint has peeled, allow the pump to dry and apply touch-up paint.

Note:

In the appendix is the sectional drawing of a model of the KTZ-series that is representative for the majority of our pumps.

Due to the large number of different models we have to ask you to contact your Tsurumi dealer if you need a parts list or a drawing of a certain model.

If the pump will not be operated for a long period of time, pull the pump up, allow it to dry, and store it indoors.

If the pump remains immersed in water, operate the pump on a regular basis (i.e. once a week) to prevent the impeller from seizing due to rust.



WARNING!

Never insert your hand or any other object into the inlet opening on the underside of the pump casing when the pump is connected to the power supply.

Before inspecting the pump casing, check that the pump has been isolated from the power supply and cannot be energized.

Make sure that the pump is completely reassembled before putting into operation again. Take care that bystanders keep a safe distance to the conduit or switch gear and avoid contact with the water.

In one application, a pump can be under constant risk, and even with frequent attention may have a short life. In another application a pump can run for years without any maintenance at all. Recommendations as to intervals, need interpretation, with the most hazardous characteristic in mind. At least superficial periodic inspection is needed in order to maintain a certain level of reliability and safety.

Interval	Inspection Item	
Monthly	1. Measuring insulation resistance	Insulation resistance reference value = 20M Ohm NOTE: The motor must be inspected if the insulation resistance is considerably lower than that obtained during the last inspection
	2. Measuring the loaded current	To be within the rated current
	3. Measuring the power supply voltage	Power supply voltage tolerance=±5% of rated voltage
	4. Inspecting the impeller	If the performance level has decreased considerably, the impeller may be worn.
Once every 2 to 5 years	Overhaul	The pump must be overhauled even if the pump appears normal during operation. The pump may need to be overhauled earlier if it is used continuously or repeatedly. NOTE: Contact your Tsurumi-dealer to overhaul the pump.
Periodical inspection and replacement of lubricant	KTV2-50, KRS2-50/80/100: Inspection: Every 2000 hours of running time or every 6 months, whichever comes first Changing interval: Every 4000 hours of running time or every 12 months, whichever comes first.	
	Other models: Inspection: Every 3000 hours of running time or every 6 months, whichever comes first. Changing Interval: Every 4000 hours of running time or every 12 months, whichever comes first	

Choking:

Access of the water to the pump and apparent discharge capacity obviously need to be checked as often as experience dictates. Suspending the pump at the ideal level, if need be from a raft, is the main thing. Basically, the strainer should be free and if the pump is meant to remove water it should not carry more sand and pebbles than necessary.

The inlet should be protected from solids, if occurring in sufficient quantity to block the holes of the strainer, preventing flow. A cage, pierced drum or mesh can help. Flow can in rare cases also be stopped by quantities of small stringy vegetal matter wrapping itself around the impeller blades.

Sand wears out the suction cover (wear plate) and shaft seal of any pump. This wear is roughly proportional to the square of the pressure, so it can be worth while using an extra large diameter delivery hose or pipe; very rarely will this lead to settling of sand or pebbles unless high concentration, an obstructed strainer, worn impeller, increased head or a constricted delivery conduit have resulted in diminished flow. If the pump is to remove water, often it can be placed on a raised object or suspended from masonry, piles or an improvised raft. If a pump buries itself in earth, or is buried by a landslide, it can be ruined in minutes.

Generating Set:

Hz to be within ±1 Hz, and voltage within ±5%, may also need to be checked frequently, if power is provided by a generating set. The lighter the generating set, the higher the risk of erratic voltage and wrong frequency.

Insulation Check:

Less obvious than oil inspection but equally valuable, is a periodic check of insulation value between the pump cable's earth lead and the other leads, and between the other leads, by means of an insulation tester. This value, well over 20 M Ohm when the pump is new or reconditioned, should be at least 10 M Ohm when the pump and its cable have been in the water for a long time. If it is down to 10M Ohm, repair in a workshop is urgently needed. It is useful to keep a record of measurements of this insulation value, and of ampere draw if possible, over the years, so as to notice a steep decline of the ohm value before a short occurs in the motor winding. Decreased ampere draw indicates impeller wear.

On workshop inspection, if it is found that the cable is at fault, it should not be re-used, even if 30 M Ohm insulation can be restored. If the motor is at fault, the winding specialist can opt for oven-drying and revarnishing under vacuum, or in a favourable case drying only. In the latter case, dry at no more than 60°C with motor protector still fitted or at not more than 105°C with motor protector removed. In case of oven drying, insulation should be higher than 5 M Ohm when hot or 20 M Ohm when cooled down.

Oil:

Replace the oil also if it is slightly greyish or contains a droplet of water. Ensure that electric power cannot be accidentally applied to the pump. Lay the pump on its side, remove the plug, holding a piece of cloth over it to prevent possible spraying. If the oil is greyish or contains water drops or dust, or if there is less than 80% of the recommended quantity left, then measure carefully at the cable's end (never open the motor outside a workshop) the ohm resistance between the leads and replace shaft seal to avoid humidity getting into the motor and shorting the windings. Use turbine oil (ISO VG32).

Use the quantity specified in the specification table. Dispose of old oil in accordance with local regulations. Carefully check the packing (gasket) of the filling plug and replace.

**CAUTION!**

In the event of inward leakage, the oil housing may be pressurized. When removing the oil plug, hold a piece of cloth over it to prevent oil from splashing.

NOTE!

Old oil should be entrusted to an oil disposal company in accordance with local regulations.

The gasket and the O-ring for the oil filler plug must be replaced with a new part at each oil inspection and change.

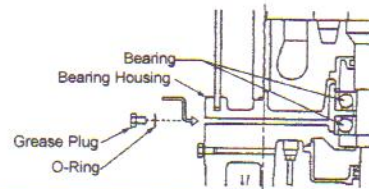
Bearing Grease (only LH with more than 55kW):

Remove grease plug {55-75kW (PT 1/8)}, {90-110kW (M12 screw)} and pour in grease according to the table and drawing below.

LH pumps with 90-110kW have an upper and lower bearing, Upper grease plug PT1/4, lower grease plug as above.

Note: Replenishment period is 3000 hours. However it may vary according to operating conditions.

Model	kind of grease	Initial quantity	Replenishment
LH855 LH675 LH875	e.g. Multemp LRL3 (Kyodo)	100g	50g
LH690 LH890 LH6110 LH8110	e.g. Multi Knock Delux Grease (Nisseki)	100g	30g
		200g	60g

**Replacing the impeller****CAUTION!**

Before disassembling and reassembling the pump, be sure that the power supply is disconnected, and remove the cable from the terminal board. To prevent serious accidents, do not perform a conduction test during disassembly and reassembly.

**CAUTION!**

A worn impeller often has sharp edges. Take care not to cut yourself on them.

**WARNING!**

Never insert your hand or any other object into the inlet opening on the underside of the pump casing when the pump is connected to the power supply.

Before inspecting the pump casing, check that the pump has been isolated from the power supply and cannot be energized.

Make sure that the pump is completely reassembled before putting into operation again. Take care that bystanders keep a safe distance and avoid contact with the water.

**CAUTION!**

Be sure to perform a trial operation when starting the pump after a reassembly. If the pump was assembled improperly, it may lead to abnormal operation, electrical shock, or water damage.

Removal of the suction cover (wear plate) and especially removal of the impeller, and even more so the shaft sealing, must be left to a mechanic. Show him the sectional view.

If the pump has a strange smell or appearance, have it cleaned professionally before the mechanic touches it.

When reassembling, the mechanic will turn the impeller by hand to check that it turns freely and that there is no ticking or grating noise from a bearing. Impellers that are not of the vortex type, have a clearance with respect to the suction cover (wear plate) of about 0,3 to 0,5 mm when new or repaired.

Trouble shooting

**CAUTION!**

To prevent serious accidents, disconnect the power supply before inspecting the pump.

Read this Operation Manual carefully before requesting repair. After re-inspecting the pump, if it does not operate normally, contact your Tsurumi-dealer.

Pump fails to start	<p>Pump is new or has been repaired and tested</p> <ul style="list-style-type: none"> • Check that voltage applied agree with rating plate. • Check at pump cable free end (never open motor) insulation value of earth lead (over 20M Ohm), and continuity of winding. On three phase motor check whether ohm values of three windings are within $\pm 10\%$. <p>Pump has been satisfactorily in use</p> <ul style="list-style-type: none"> • Same as above except that also impeller needs to be checked (stone, debris, rust between impeller blades and suction cover after long disuse).
Pump starts but stops immediately, causing the motor protector to actuate	<ul style="list-style-type: none"> • Motor windings or cable damaged. Do not open motor. Check as above. • Impeller blocked or choked. • If pump is new, wrong voltage or frequency. • Voltage too low (most common cause); check supply voltage under load. • If voltage is from diesel generator, inexact frequency. • Wrong direction of rotation. • Liquid of too high viscosity or density. • Wrong setting of thermal overload unit.
The pump's head and pumping volume is lower	<ul style="list-style-type: none"> • Wrong direction of rotation. • Piping resistance too high. • Impeller worn, partially choked or severely narrowed by hard deposits. • Strainer or inlet blocked. • Pump draws air, or liquid is partly volatile or contains high level of gas in solution.
The pump generates noise or vibration	<ul style="list-style-type: none"> • Wrong direction or rotation. • Solid object (stone, etc.) in volute. • Impeller severely damaged, or bearing damaged. Repair at once. • Pump lying on its side and drawing a little air. High wear rate likely.

Description of parts:
(see exploded view in appendix)

No.	Part Name	No.	Part Name	No.	Part Name
1	Hexagonal bolt	12	Hexagonal bolt	23	Impeller nut
2	Spring washer	13	Shaft sleeve	24	Suction cover packing (gasket)
3	Mechanical seal	14	Pump casing	25	Suction cover
4	Oil ring	15	Spring washer	26	Spring washer
5	Rounded head screw	16	Hexagonal bolt	27	Hexagonal bolt
6	O-ring	17	O-ring	28	Spring washer
7	Packing (Gasket)	18	Labyrinth ring	29	Stud bolt
8	Oil casing	19	Impeller adjusting washer	30	Strainer
9	Packing (Gasket)	20	Impeller	31	Bottom plate
10	Oil plug	21	Impeller thread protective cover	32	Spring washer
11	Spring washer	22	Hexagonal nut	33	Hexagonal bolt

50 Hz	P ₂ [kW]	P ₁ [kW]	C [rpm]	I ₀ [A]		I _{max} [A]		[no./mm ²]	[m] ISO VG32	[m H ₂ O]	[kg]	[mm]			Q _{max} [l/min]	H _{max} [m]			
				400V	230V	400V	230V					400V	230V	1				2	3
				A	B	C													
LH615	15	18,7	2850	27,5	-	169,5	-	H07RN-F 4Cx6mm ²	-	3850	H-30T	50	213	330	330	1098	2400	52,0	II
LH619	19	21,9	2850	34,0	-	249,0	-	H07RN-F 4Cx10mm ²	-	6900	H-35T	50	350	420	420	1473	4300	42,0	II
LH422	22	25,6	2850	41,0	-	288,5	-	H07RN-F 4Cx10mm ²	-	6900	H-35T	50	350	420	420	1402	2400	66,0	II
LH622	22	25,6	2850	41,0	-	288,5	-	H07RN-F 4Cx10mm ²	-	6900	H-35T	50	360	420	420	1473	3700	54,0	II
LH430	30	33,6	2850	53,0	-	385,0	-	2PNCFTF9Cx22mm ²	-	6900	H-35T	50	355	420	420	1402	3700	80,0	III
LH637	37	42,0	2850	67,0	-	434,0	-	2PNCFTF9Cx22mm ²	-	4800	HT-4550N	100	495	530	530	1448	2650	90,0	III
LH837	37	42,0	2850	67,0	-	434,0	-	2PNCFTF9Cx22mm ²	-	4800	HT-4550N	100	495	530	530	1488	5400	51,0	III
LH645	45	50,8	2850	81,0	-	527,0	-	2PNCFTF6Cx22mm ² /1Cx22mm ² /2Cx22mm ²	-	4800	HT-4550N	100	510	530	530	1488	2950	90,0	III
LH845	45	50,8	2850	81,0	-	527,0	-	2PNCFTF6Cx22mm ² /1Cx22mm ² /2Cx22mm ²	-	4800	HT-4550N	100	510	530	530	1488	5450	51,0	III
LH855	55	63,8	2850	99,0	-	704,0	-	2PNCFTF6Cx30mm ² /1Cx22mm ² /3Cx22mm ²	-	6500	H-50T	50	810	550	550	1716	5700	70,0	IV
LH675	75	83,5	2850	130	-	1112	-	2PNCFTF6Cx30mm ² /1Cx22mm ² /2Cx22mm ²	-	6500	H-50T	50	850	550	550	1676	2450	132,0	IV
LH875	75	83,5	2850	130	-	1112	-	2PNCFTF6Cx30mm ² /1Cx22mm ² /2Cx22mm ²	-	6500	H-50T	50	850	550	550	1716	6500	70,0	IV
LH690	90	103	2850	170	-	1100	-	2PNCFTF7Cx38mm ² /2PNCFTF3Cx38mm ²	-	8000	H-50T	50	1100	592	592	1787	2500	150,0	V
LH890	90	103	2850	170	-	1100	-	2PNCFTF7Cx38mm ² /2PNCFTF3Cx38mm ²	-	8000	H-50T	50	1150	592	592	1787	6000	90,0	V
LH6110	110	124	2850	205	-	1260	-	2PNCFTF7Cx38mm ² /2PNCFTF3Cx38mm ²	-	8000	H-50T	50	1200	592	592	1787	3000	177,0	V
LH8110	110	124	2850	205	-	1260	-	2PNCFTF7Cx38mm ² /2PNCFTF3Cx38mm ²	-	8000	H-50T	50	1250	592	592	1787	6500	107,0	V

I

U	V	G
brown	blue	Earth (green/yellow)
braun	blau	Erde (grün/gelb)
marron	bleu	Terre (vert/jaune)
marrone	blu	Terra (verde/giallo)
marron	azul	Tierra (verde/amarillo)
castanho	azul	Terra (verde/amarelo)
κόκκινο	μπλε	Γη (πράσινο/κίτρινο)
kahvereng	mavi	Toprak (yesil/sari)
bruin	blauw	massa (groen/geel)
brun	blå	jord (grønn)
brun	blå	jord (grøn)
brun	blå	Jord (grøn/gul)
ruskea	sininen	Maa (vihreä/keltainen)
bruns	zils	iezemėjums/zāle/dzeltenš
bruun	sinine	Maa (roheline/kollane)
brazowy	niebieski	uziemienic (zielony/zółty)
barna	kék	föld (zöld/sárga)

II

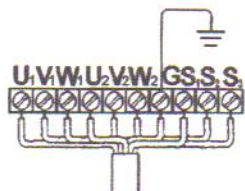
U	V	W	G	
brown	blue	grey	black	Earth (green/yellow)
braun	blau	grau	schwarz	Erde (grün/gelb)
marron	bleu	gris	noir	Terre (vert/jaune)
marrone	blu	grigio	nero	Terra (verde/giallo)
marron	azul	gris	negro	Tierra (verde/amarillo)
castanho	azul	cinzento	preto	Terra (verde/amarelo)
κόκκινο	μπλε	γκρίζο	μαύρο	Γη (πράσινο/κίτρινο)
kahvereng	mavi	gri	siyah	Toprak (yesil/sari)
bruin	blauw	gris	zwart	massa (groen/geel)
brun	blå	grå	svart	jord (grønn)
brun	blå	grå	svart	jord (grøn)
brun	blå	grå	svart	Jord (grøn/gul)
ruskea	sininen	harmaa	musta	Maa (vihreä/keltainen)
bruns	zils	pelēks	melns	iezemėjums/zāle/dzeltenš
bruun	sinine	halli	must	Maa (roheline/kollane)
brazowy	niebieski	szary	czarny	uziemienic (zielony/zółty)
barna	kék	szürke	fekete	föld (zöld/sárga)

U	V	W	G
red	white	black	Earth (green)
rot	weiß	schwarz	Erde (grün)
rouge	blanc	noir	Terre (vert)
rosso	bianco	nero	Terra (verde)
rojo	blanco	negro	Tierra (verde)
vermelho	branco	preto	Terra (verde)
κόκκινο	ασπρο	μαύρο	Γη (πράσινο)
kirmiz	bevez	siyah	Toprak (yesil)
rood	wit	zwart	massa (groen)
red	hvit	svart	jord (grønn)
red	hvid	sort	jord (grøn)
red	vit	svart	Jord (grøn)
punainen	valkoinen	musta	Maa (vihreä)
sarkans	balts	melns	iezemėjums - zāle
punane	valge	must	Maa (roheline)
czernony	biały	czarny	uziemienic (zielony)
piros	fehér	fekete	föld (zöld)

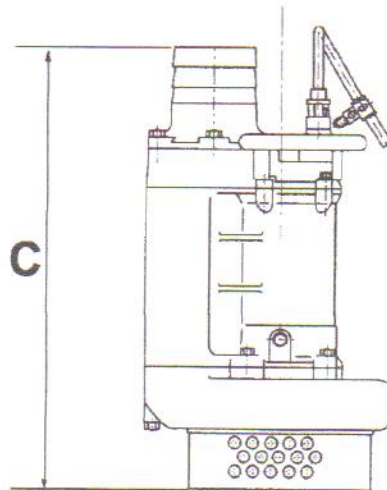
III

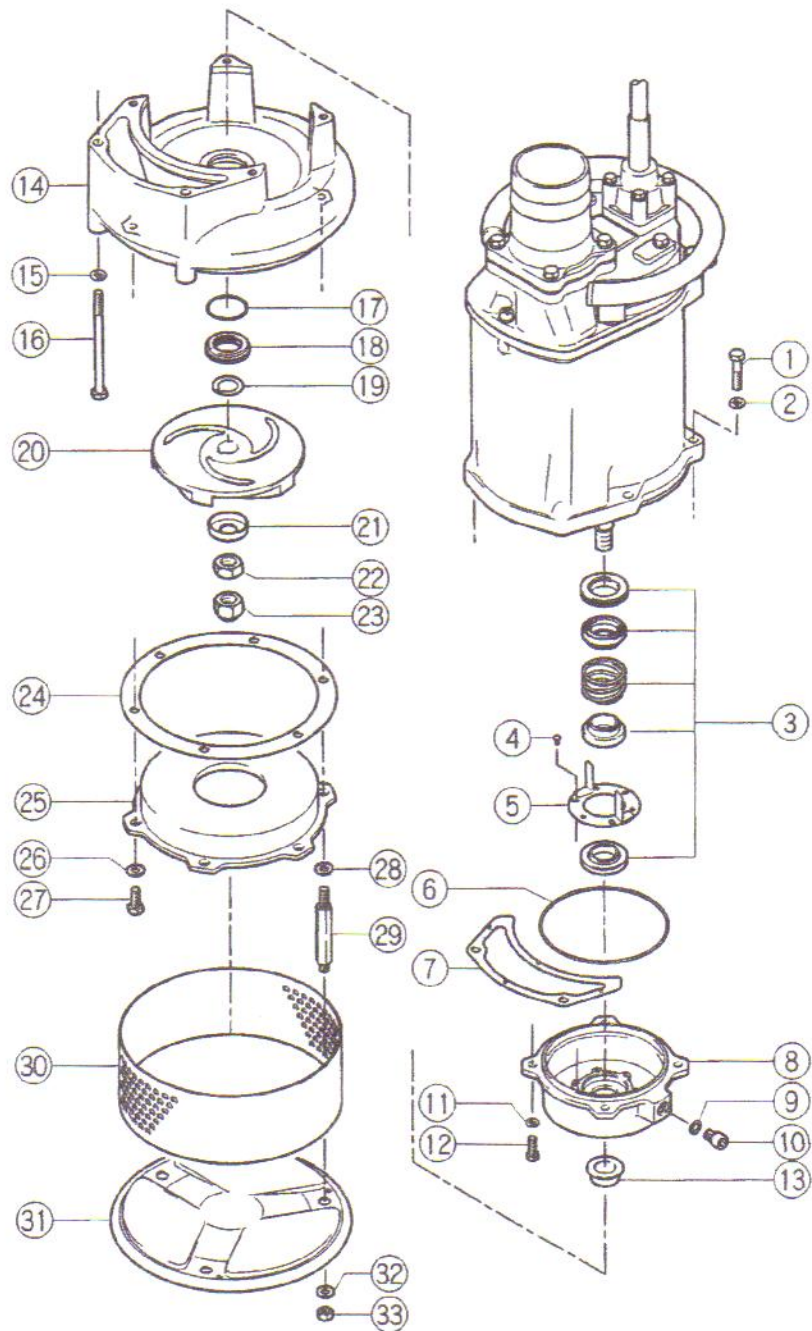
U1	V1	W1	U2	V2	W2	G	S1	S2
red	white	black	black	red	white	Earth (green)	Protector Circuit (yellow)	Protector Circuit (yellow)
rot	weiß	schwarz	schwarz	rot	weiß	Erde (grün)	Schutzschalter (gelb)	Schutzschalter (gelb)
rouge	blanc	noir	noir	rouge	blanc	Terre (vert)	Circuit de protection (jaune)	Circuit de protection (jaune)
rosso	bianco	nero	nero	rosso	bianco	Terra (verde)	Circuito di protezione (giallo)	Circuito di protezione (giallo)
rojo	blanco	negro	negro	rojo	bianco	Tierra (verde)	circuito protector (amarillo)	circuito protector (amarillo)
vermelho	branco	preto	preto	vermelho	branco	Terra (verde)	Circuito protector (amarelo)	Circuito protector (amarelo)
κόκκινο	ασπρο	μαύρο	μαύρο	κόκκινο	ασπρο	Γη (πράσινο)	Όργανο προστασίας (κίτρινο)	Όργανο προστασίας (κίτρινο)
kirmiz	bevez	siyah	siyah	kirmiz	bevez	Toprak (yesil)	Koruma salteri (sari)	Koruma salteri (sari)
rood	wit	zwart	zwart	rood	wit	massa (groen)	beveiligingsschakelaar (geel)	beveiligingsschakelaar (geel)
red	hvit	svart	svart	red	hvit	jord (grønn)	motorbeskyttelse krets (gul)	motorbeskyttelse krets (gul)
red	hvid	sort	sort	red	hvid	Jord (grøn)	Sikkerhedsafbryder (gul)	Sikkerhedsafbryder (gul)
red	vit	svart	svart	red	vit	Jord (grøn)	Motorskydd (gul)	Motorskydd (gul)
punainen	valkoinen	musta	musta	punainen	valkoinen	Maa (vihreä)	Moottorisuoja (keltainen)	Moottorisuoja (keltainen)
sarkans	balts	melns	melns	sarkans	balts	iezemėjums/zāle	aizsardzības aede (dzeltens)	aizsardzības aede (dzeltens)
punane	valge	must	must	punane	valge	Maa (roheline)	Kaitselüübi (kollane)	Kaitselüübi (kollane)
czernony	biały	czarny	czarny	czernony	biały	uziemienic (zielony)	wyłącznik bezpieczeństwa (żółty)	wyłącznik bezpieczeństwa (żółty)
piros	fehér	eketa	eketa	piros	fehér	föld (zöld)	védekepcső (sárga)	védekepcső (sárga)

71

IV		U1	V1	W1	U2	V2	W2	G	S1	S2	S3
		red	white	black	black	red	white	Earth (green)	Protector Circuit (yellow)	Protector Circuit (yellow)	Leakage Detector (white)
		rot	weiß	schwarz	schwarz	rot	weiß	Erde (grün)	Schutzschalter (gelb)	Schutzschalter (gelb)	Lecksensor (weiß)
		rouge	blanc	noir	noir	rouge	blanc	Terre (vert)	Circuit de protection (jaune)	Circuit de protection (jaune)	Détecteur des fuites (blanc)
		rosso	bianco	nero	nero	rosso	bianco	Terra (verde)	Circuito di protezione (giallo)	Circuito di protezione (giallo)	Rivelatore di perdite (bianco)
		rojo	blanco	negro	negro	rojo	blanco	Tierra (verde)	Circuito protector (amarillo)	Circuito protector (amarillo)	Sonda detector (blanco)
		vermelho	branco	preto	preto	vermelho	branco	Terra (verde)	Circuito protector (amarelo)	Circuito protector (amarelo)	Detector de fugas (branco)
		κόκκινο	δάκτυο	μαύρο	μαύρο	κόκκινο	δάκτυο	Γη (πράσινο)	Όργανο προστασίας (κίτρινο)	Όργανο προστασίας (κίτρινο)	Ανευρέτης υγρασίας (δάκτυο)
		kırmızı	beşaz	siyah	siyah	kırmızı	beşaz	Toprak (yeşil)	Koruma şalteri (sarı)	Koruma şalteri (sarı)	Sızıntı algılayıcısı (beşaz)
		rood	wit	zwart	zwart	rood	wit	massa (groen)	beveiligingsschakelaar (geel)	beveiligingsschakelaar (geel)	leaksensor (wit)
		rođ	hvít	svart	svart	rođ	hvít	jord (grøn)	motorbeskyttelse krets (gul)	motorbeskyttelse krets (gul)	lekasje detektor (hvít)
		rođ	hvít	svart	svart	rođ	hvít	jord (grøn)	Sikkerhedsafbryder (gul)	Sikkerhedsafbryder (gul)	Lækagesensor (hvít)
		rođ	vít	svart	svart	rođ	vít	Jord (grøn)	Motorskydd (gul)	Motorskydd (gul)	Läckdetektor (vít)
		punainen	valkoinen	musta	musta	punainen	valkoinen	Maa (vihreä)	Moottorisuoja (keltainen)	Moottorisuoja (keltainen)	Vuodotunnistin (valkoinen)
		sarkans	balts	melns	melns	sarkans	balts	iežemējums(zaļš)	aizsardzības eedē (dzeltens)	aizsardzības eedē (dzeltens)	Noplūdes detektors (balts)
punane	valge	must	must	punane	valge	Maa (roheline)	Kaitseülitid (kollane)	Kaitseülitid (kollane)	Lekkedelektor (valge)		
czernony	biały	czarny	czarny	czernony	biały	ziemia(zielony)	właznik bezpieczeństwa (żółty)	właznik bezpieczeństwa (żółty)	czujnik szczelności (biały)		
piros	fehér	fekete	fekete	piros	fehér	föld (zöld)	védőkapcsoló (sárga)	védőkapcsoló (sárga)	szivárgásvédelem (fehér)		

V		U1	V1	W1	U2	V2	W2	G	S1	S2	S3
		red	white	black	black	red	white	Earth (green)	Protector Circuit (yellow)	Protector Circuit (yellow)	Leakage Detector (white)
		rot	weiß	schwarz	schwarz	rot	weiß	Erde (grün)	Schutzschalter (gelb)	Schutzschalter (gelb)	Lecksensor (weiß)
		rouge	blanc	noir	noir	rouge	blanc	Terre (vert)	Circuit de protection (jaune)	Circuit de protection (jaune)	Détecteur des fuites (blanc)
		rosso	bianco	nero	nero	rosso	bianco	Terra (verde)	Circuito di protezione (giallo)	Circuito di protezione (giallo)	Rivelatore di perdite (bianco)
		rojo	blanco	negro	negro	rojo	blanco	Tierra (verde)	Circuito protector (amarillo)	Circuito protector (amarillo)	Sonda detector (blanco)
		vermelho	branco	preto	preto	vermelho	branco	Terra (verde)	Circuito protector (amarelo)	Circuito protector (amarelo)	Detector de fugas (branco)
		κόκκινο	δάκτυο	μαύρο	μαύρο	κόκκινο	δάκτυο	Γη (πράσινο)	Όργανο προστασίας (κίτρινο)	Όργανο προστασίας (κίτρινο)	Ανευρέτης υγρασίας (δάκτυο)
		kırmızı	beşaz	siyah	siyah	kırmızı	beşaz	Toprak (yeşil)	Koruma şalteri (sarı)	Koruma şalteri (sarı)	Sızıntı algılayıcısı (beşaz)
		rood	wit	zwart	zwart	rood	wit	massa (groen)	beveiligingsschakelaar (geel)	beveiligingsschakelaar (geel)	Leksensor (wit)
		rođ	hvít	svart	svart	rođ	hvít	jord (grøn)	motorbeskyttelse krets (gul)	motorbeskyttelse krets (gul)	lekasje detektor (hvít)
		rođ	hvít	svart	svart	rođ	hvít	jord (grøn)	Sikkerhedsafbryder (gul)	Sikkerhedsafbryder (gul)	Lækagesensor (hvít)
		rođ	vít	svart	svart	rođ	vít	Jord (grøn)	Motorskydd (gul)	Motorskydd (gul)	Läckdetektor (vít)
		punainen	valkoinen	musta	musta	punainen	valkoinen	Terra (vihreä)	Moottorisuoja (keltainen)	Moottorisuoja (keltainen)	Vuodotunnistin (valkoinen)
		sarkans	balts	melns	melns	sarkans	balts	iežemējums(zaļš)	iežemēlums (zaļš)	iežemēlums (zaļš)	Noplūdes detektors (balts)
punane	valge	must	must	punane	valge	Maa (roheline)	Kaitseülitid (kollane)	Kaitseülitid (kollane)	Lekkedelektor (valge)		
czernony	biały	czarny	czarny	czernony	biały	ziemia(zielony)	właznik bezpieczeństwa (żółty)	właznik bezpieczeństwa (żółty)	czujnik szczelności (biały)		
piros	fehér	fekete	fekete	piros	fehér	föld (zöld)	védőkapcsoló (sárga)	védőkapcsoló (sárga)	szivárgásvédelem (fehér)		







Declaration of Conformity
Konformitätserklärung
Déclaration de Conformité
Dichiarazione di Conformità
Declaración de Conformidad
Delaração de Conformidade
Δήλωση Συμμόρφωσης
Uygunluk açıklaması
Overeenkomstigheidsverklaring
Overenstemmelseserklæring
Konformitetserklæring
Försäkran om överensstämmelse
Vaatimustenmukaisuusvakuutus
Atbilstības Sertifikāts
Vastavuse deklaratsioon
Oświadczenie
Konformitási Nyilatkozta

We, Tsurumi Mfg. Co. Ltd., declare that our Pumps of KTV(E)-series, KTZ-series, KRS-series, NKZ-series, GH-series, LH-series and GPN-series, pump type and serial number shown on the name plate, are constructed in accordance with directives 98/37/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC (CE-Marking).

Wir, das Unternehmen Tsurumi Mfg. Co. Ltd., erklären hiermit verbindlich, daß die Pumpen unserer KTV(E)-Serie, KTZ-Serie, KRS-Serie, NKZ-Serie, GH-Serie, LH-Serie und GPN-Serie, Typbezeichnung und Seriennummer nach Typenschild, den EU-Vorschriften 98/37/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC (CE-Marke) entsprechen.

Nous soussignés Tsurumi Mfg. Co. Ltd., déclarons que nos pompes de la série KTV(E), KTZ, KRS, NKZ, GH, LH et GPN, dont le type et le numéro de série son indiqués sur la plaque signalétique sont conçues conformément aux directives 98/37/EEC, 91/368/CEE, 93/44/CEE, 93/68/CEE (label CEE).

La Tsurumi Mfg. Co. Ltd., dichiara che le proprie pompe serie KTV(E), serie KTZ, serie KRS, serie NKZ, serie GH, serie LH e serie GPN, il tipo di pompa e il numero di serie mostrato sulla targhetta del nome sono costruite in conformità alle direttive 98/37/EEC, 91/368/CEE, 93/44/CEE, 93/68/CEE (Marchio CE).

Nosotros, TUSURMI Mfg. Co. Ltd., declaramos que nuestras bombas KTV(E), KTZ, KRS, NKZ, GH, LH y GPN con el número de serie indicado en la placa característica, están fabricados de acuerdo con las directrices 98/37/EEC, 91/368/EEC, 93/44/EEC y 93/68/EEC.

Tsurumi Mfg. Co. Ltd., declara que, as nossas bombas das séries KTV(E), KTZ, KRS, NKZ, GH, LH e GPN, modelo da bomba e número de série, da chapa de características, são de acordo com as directivas 98/37/EEC, 91/368/CEE, 93/44/CEE, 93/68/CEE (Marca CE)

Εμείς, στην Tsurumi Mfg. Co. Ltd., δηλώνουμε ότι οι αντλίες μας των σειρών KTV(E), KTZ, KRS, NKZ, GH, LH, GPN με τον τύπο αντλίας και αριθμό σειράς που αναγράφεται στην πινακίδα, κατασκευάζονται σύμφωνα με τις κοινοτικές οδηγίες 98/37/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC (σήμα CE).

Biz, Tsurumi Mfg. Co. Ltd., bizim KTV(E), KTZ, KRS, NKZ, GH, LH ve GPN pompa modelerinin, isim plakasında pompa tipt ve seri numaraları gösterilmiştir, 98/37/EEC, 91/368/EEC, 93/68/EEC (CE Markası) 93/44/EEC kurallanna göre planlanıp çizilmiş olduğunu açıklıyoruz.

Wij, Tsurumi Mfg. Co. Ltd., verklaren hiermee dat de pompen van onze KTV(E)-serie, KTZ-serie, KRS-serie, NKZ-serie, GH-serie, LH-serie en GPN-serie typenummer en serienummer en fabricaatnummer volgens het typeplaatje, met de EU-voorschriften 98/37/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC (CE-merk) overeenkomen.

Vi, Tsurumi Mfg. Co. Ltd., erklærer at våre pumper i KTV(E)-serien, KTZ-serien, KRS-serien, NKZ-serien, GH-serien, LH-serien og GPN-serien, som alle har serienummer og pumpetype vist på merkeskiltet, er konstruert i overensstemmelse med direktivene 98/37/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC (CE-merking).

Vi, Tsurumi Mfg. Co. Ltd., erklærer, at vore pumper i serierne KTV(E), KTZ, KRS, NKZ-series, GH, LH og GPN, hvor pumpetype og serienummer er oplyst på navneskiltet, er konstrueret i overensstemmelse med direktiverne 98/37/EEC, 91/368/EEC, 93/44/EEC og 93/68/EEC (CE-mærkning).

Vi, Tsurumi Mfg. Co. Ltd., förklarar att våra pumptyper KTV(E), KTZ, KRS, NKZ, GH, LH och GPN, vars pumptyp och tillverkningsnummer anges på typskylten, är konstruerade i enlighet med direktiven 98/37/EEC, 91/368/EEC, 93/44/EEC og 93/68/EEC (CE-märkning).

Me Tsurumi Mfg. Co. Ltd., vakuutamme täten, että pumpputyypimme KTV(E), KTZ, KRS, NKZ, GH, LH ja GPN, joiden pumpputyypit ja valmistusnumero on ilmoitettu tyypikkilvellä, on valmistettu direktiivien 98/37/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC (CE-merkki) vaatimusten mukaisesti.

Mēs, Tsurumi Mfg. Co. Ltd., paziņojam, ka mūsu sūkņi: sērija KTV(E), sērija KTZ, sērija KRS, sērija NKZ, sērija GH, sērija LH, sērija GPN, un to sērijas numuri, kuri norādīti uz datu plāksnītēm, atbilst direktīvu 98/37/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC prasībām (marķējums CE).

Meie, Tsurumi Mfg. Co. Ltd., teatame, et meie KTV(E)-seeriaste, KTZ-seeriaste, KRS-seeriaste, NKZ-seeriaste, GH-seeriaste, LH-seeriaste ja GPN-seeriaste pumbad, pumba tüüp ja seeria number ära näidatud nimesildil, on konstrueeritud kooskõlas 98/37/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC (CE-märgistus) direktiividega.

My, przedsiębiorstwo Tsurumi Mfg. Co. Ltd., niniejszym wiążąc oświadczamy, że pompy naszej serii KTV(E), KTZ, KRS, NKZ, GH, LH, GPN odpowiadają oznakowaniu typu oraz numerowi seryjnemu wskazanemu na tabliczce znamionowej oraz odpowiadają przepisom Unii Europejskiej 98/37/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC (znak CE).

A Tsurumi Mfg. Co. Ltd., felelőssége tudatában kijelenti, hogy a KTV(E), KTZ, KRS, NKZ, GH, LH és GPN sorozatú szivattyúi, típusmegnevezés és gyári szám a teljesítménytábla szerint, megfelelnek a 98/37/EEC, 91/368/EEC, 93/44/EEC, 93/68/EEC (CE-jel) számú EU-előírásoknak.

Kyoto, Japan
October 1st, 2004

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