ICE
group sc

ul. Żorska 14, 44-203 Rybnik
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NIP 642-16-18-551
REGON 273073007

MASTER FF

fruit feeder

Instruction

ICE
group sc

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NIP 642-16-18-551
REGON 273073007

DECLARATION OF CONFORMITY

The Company „Ice group s.c." declares that:

Fruit feeder

MASTER

(serial no 533)

to which the following declaration refers, is in conformity with all standards required by law regarding the safety of operation and hygiene.

RYBNIK, 10 March 2003.

.....
(signature and seal)

Congratulations due to your good choice. Thank you for your trust.

Content:

Jelsd : 691115

A. DESCRIPTION

I. SAFETY OPERATION - CONDITIONS OF SAFETY WORK AND HY-GIENE.

1. Before machine placing and starting, it is necessary to get familiar with this service manual. Mi-suse of its instructions may cause loss of warranty rights and complaints, and it may cause acci-dent.
2. Machine can be operated only by qualified staff. Producer ensures training of User's staff before starting.
3. Machine ready for operation shall be levelled, stable and shall be protected against moving.
4. Work-place should be well lightened.
5. During work operator shall wear well fastened protective clothes, and he shall have head gear. Clothes should exclude possibility of catching any parts of clothes by mobile and exposed machine elements.
6. Machine cannot be operated by drunk person nor person after the use of stupefacients.
7. Smoking near machine is prohibited.
8. Working machine cannot be left without operator's supervision.
9. Work with removed or unlocked guards is prohibited.
10. Work with open security grid of the container is prohibited.
11. If otherwise stated in the service manual work with removed cover of vertical channel of solid particles is prohibited (control of level of additives in the channe).
12. Machine cannot be regulated during work, except cases which are described in service manual (for example capacity adjustment).
13. In the case of machine disturbances it must be immediately switched off by emergency switch (push-button).
14. Washing of machine during its work is prohibited.
15. Before washing machine shall be disconnected.
16. Elements of electrical and automatic systems cannot be wet nor moist.
17. Any repairs and technical inspections shall be conducted only by qualified person.
18. During warranty period and in case of machine failure, it is recommended to call producer's ser-vice.
19. Before machine maintenance, repairs or technical inspections, it is necessary to switch it off by the main switch.
20. Before repairs of electric system, machine shall be disconnected from supply.
21. Worn or damaged elements shall be replaced only by neworiginal ones.

MASTER FF is admitted by the State Hygiene Office. Device is protected against short-circuit by the means of S-193 electric switch. Motors are protected by the means of individual magnetothermic protections of M-250 type. Fire protection is realized by protective neutralization. Control circuits are made for safe voltage 24V. Used electric box is made in protection class IP65 according to PN-E-08106. Both, electric box and security grid of solid particles container are protected against opening by the means of mechanical door lock, which in the case of its opening gives immediately lockout of machine supply. Machine is protected against mechanical damages by adjusted safety coupling .

II. COMPLETE DELIVERY.

1. Fruit feeder MASTER FF.
   - Body with drives – 1pcs.,
   - Mass pump - 1 pcs.,
   - Container of solid particles vith mixer – 1 pcs.,
   - Vertical mixer – 1pcs.,
   - Feeding worm – 2pcs.
2. Spare parts:
   - blades of mass pump – 1 set.,
   - simering A0 25x35x7 – 1 pcs.,
   - simering A0 40x55x7 – 1 pcs.,
   - „O- ring" seals - 1 set.,
   - joint brackets – seals DN80 – 2 pcs.,
   - joint brackets – seals DN65 – 2 pcs.,
   - electrical box key – 1 pcs.,
   - bulbs ZBVB1 -24V – 1 pcs.
3. Service manual – 1 pce.

III. TECHNICAL DATA.

Type	1200
Capacity, l/ h	150 ÷ 1200
Content of solid particles in ice mass, %	5 ÷ 25
Installed power, kW	2,5
Supply	3x380 V, 50 Hz
Dimensions (W x D x H), mm	700 x 1000 x 1900
Weight, kg	300

IV. APPLICATION.

Fruit feeder MASTER FF is the machine for flow mixing ice mass with of solid particles like: nuts, fruits, chocolate particles, dried fruits, jams and syrups. Machine is designed for cooperation with freezers of continuous operation of TYTAN series and it may be connected to machines filling cups, horns, dishes, etc.
Modern design and technical characteristic make that MASTER FF is machine easy in use and which do not need complicated maintenance.

V. STRUCTURE AND OPERATION.

Solid particles added to ice mass are slided to the container through the protective grid, from which they are transported via feeding worm to the mass pump. Horizontal mixer in the container protects against conglutinating of particles into one mass. Rotational sliding-vane pump bonds ice mass with particles, and then the pump forces through the mass to dozing and packing machines via vertical mixer. Here take place accurate mixing of particles with the mass.
MASTER FF consists of following sub-assemblies: body containing machine drive systems, container of solid particles with the mixer and feeding worm, mass pump, horizontal mixer and control panel.
Body is placed on castoring wheels, so the whole machine may be easy displaced and positioned in suitable place. There are elements of machine drive systems inside the body. Drive of mass pump and drive of feeding worm are realized by electric motors connected with variators and reducers: cylindrical - for mass pump and worm one - for feeding worm. Drive on the mass pump is transfered by the means of safety coupling. By the means of handwheels placed from the side of machine, rotational speeds of the pump and machine capacity and content of solid particles also may be changed.

CAUTION !
Changes of rotational speeds of the pump and worm may be done only during machine operation.

Turning the wheels during machine stop may cause damage of motovariators. Producer is not resposible for such damages.
Mixer drives (of solid particles and vertical one) are realized by electric motors connected with worm reducers.
There is protective grid under the flap of solid particles container. The grid protects against incidental personal injury during pouring solid particles (ice additives). It cannot be lifted during machine operation. Its raising causes immediate disconnection of current generator. The grid may be lifted for washing when machine is disconnected from the current generator.
Machine operation may be checked by half-opening the cover of mass vertical channel. Never put hands and any objects to the channel during machine work. Channel may be washed only after disconnection of current.

VI. INSTALLATION AND CONNECTING.

1. Machine unloading and displacement.

Machine is transported on the transporting pallet covered by the box.
It is necessary to check machine weight in order to choose fork truck (Draw. 3). Machine weight is given in Table of technical data (Chapter III).
In case of unloading by means of lift it is necessary to compare its lifting capacity with machine weight. For unloading the box should be protected by lines or belts as it is presented on Draw.8.

2. Unpacking and positioning.

Unscrew screws fixing the box. Lift up the box and take it off from the pallet. Take off the tool box and other elements separately mounted (spare parts, castoring wheels). Lift up the machine with the pallet and unsrew 4 fixing screws at the bottom. Take off the pallet and screw in castoring wheels in place of screws.
In order to move machine without the box unlock brakes on castoring wheels.
After machine positioning secure it by locking the brakes on castoring wheels. Device must be stabile in working place.

3. Connecting of machine.

Before conection and start-up machine must be washed and disinfected acc. to instructions contained in Chapter VIII. Check if machine is stabile.
According to client's reguirements machine feeding cable (min. cable section is 2,5 mm^2) is equipped with plug having 4 or 5 contacts. Device shall have protection against electric shock i.e. it has protective earthing. Check if voltage is consistent with voltage suitable for that device. Connect cu-rrent supply to the main switch. Electric connections shall be consistent with valid Polish norms. After connection it is necessary to check direction of rotations of drive motors.
At the end connect ice mass installation to the outlet stud pipe of the pump and outletting installation to the outlet stud pipe on the vertical mixer (standard stud pipes for flexible hoses ∅ 38).
Check dairy joints.

4. Storage.

In case of storage it is necessary to take into consideration that machine shall be stored in dry place due to electric installation and electronic systems.
If storage takes more then 7 days you should:

- thoroughly wash and disinfect machine from any contaminations (acc. to Chapter VIII),
- lubricate all sliding sleeves according to Chapter IX.

VII. PRINCIPLE OF OPERATION.

1. Start.

Machine delivered to Polish customer is started by producer's service.
During machine start up producer ensures training of client's personnel.

After connection of electrical and dairy supply to the machine, it may be started. Procedure of machine starting is following:

- check positions of safety cut out switches,
- set the main switch on position „1",
- turn on vertical mixer,
- switch on mass pump,
- turn on feeding of mass from the freezer,
- check the work of pump and mixer,
- wait until ice mass freezes each machine element,
- turn off the mixer of solid particles,
- pour ice additives to the container of solid particles through protective grid,
- turn on worm feeder.

Do not start feeder of solid particles before you get certainty of proper operation of mass pump and vertical mixer. Mass pump shouldn't work „on dry".

2. Regulation.

Regulation of solid particles content in ice mass is realized by the change of rotational speed of worm feeder. By turning the lever of the worm variable gear to the right we decrease such content, by turning to the left we increase the amount of solid particles in the mass.

CAUTION !
Look if the blade pump copes with receiving of solid particles. Check the level of ice additives in vertical channel.

When pump doesn't cope with receiving increase its rotations. If it doesn't help decrease speed of worm feeder.
Selection of pump capacity shall be done depending on kind of fed material.
In case of disturbances of machine operation it is necessary to stop it by emergancy switch.

3. Stop.

In order to stop the machine you should stop following elements in given sequence:

1. worm feeder,
2. mixer of solid particles,
3. freezer of ice mass,
4. blade pump,
5. vertical mixer.

CAUTION !
If we turn off the pump first we cause outflow of ice mass through the vertical channel of solid particles.

The same effect we can get in case of start of the freezer without prior turning on the blade pump. So we will be forced to stop and wash all devices and then to again their restart.

VIII. WASHING.

Before beginning of production and after each finished shift wash the machine. Primary washing shall be realized during machine flow by pumping washing solution via input stub pipe for ice mass. Blade pump shall work. Container of solid particles shall be washed by flowing water at working worm feeder. Washing by steam is prohibited.

CAUTION !
Before final washing fix side machine covers, close electric box and remove electric conduit from the socket.

Final wsahing shall be done manually. Disassembly blade pump, feeding worm and the mixer of solid particles container. Such operation is necessary because solid particles come between slots and mobile elements of the device making impossible proper washing during the flow.

CAUTION !
After each use machine shall be washed, otherwise it may come to bacterial infection during pri-mary production.

IX. TECHNICAL INSPECTIONS.

CAUTION !
Before any maintenance of machine, it is necessary to switch it off by the main switch.

After machine unpacking and after each 100 working hours check and tighten screws. Next inspec-tions shall be done once a month and after the end of season. Due to simple machine construction maintenance only constists of surveys of:

- teflon sleeves of the worm feeder and mixers,
- mass pump sleeves,
- packings of pump and its flap.

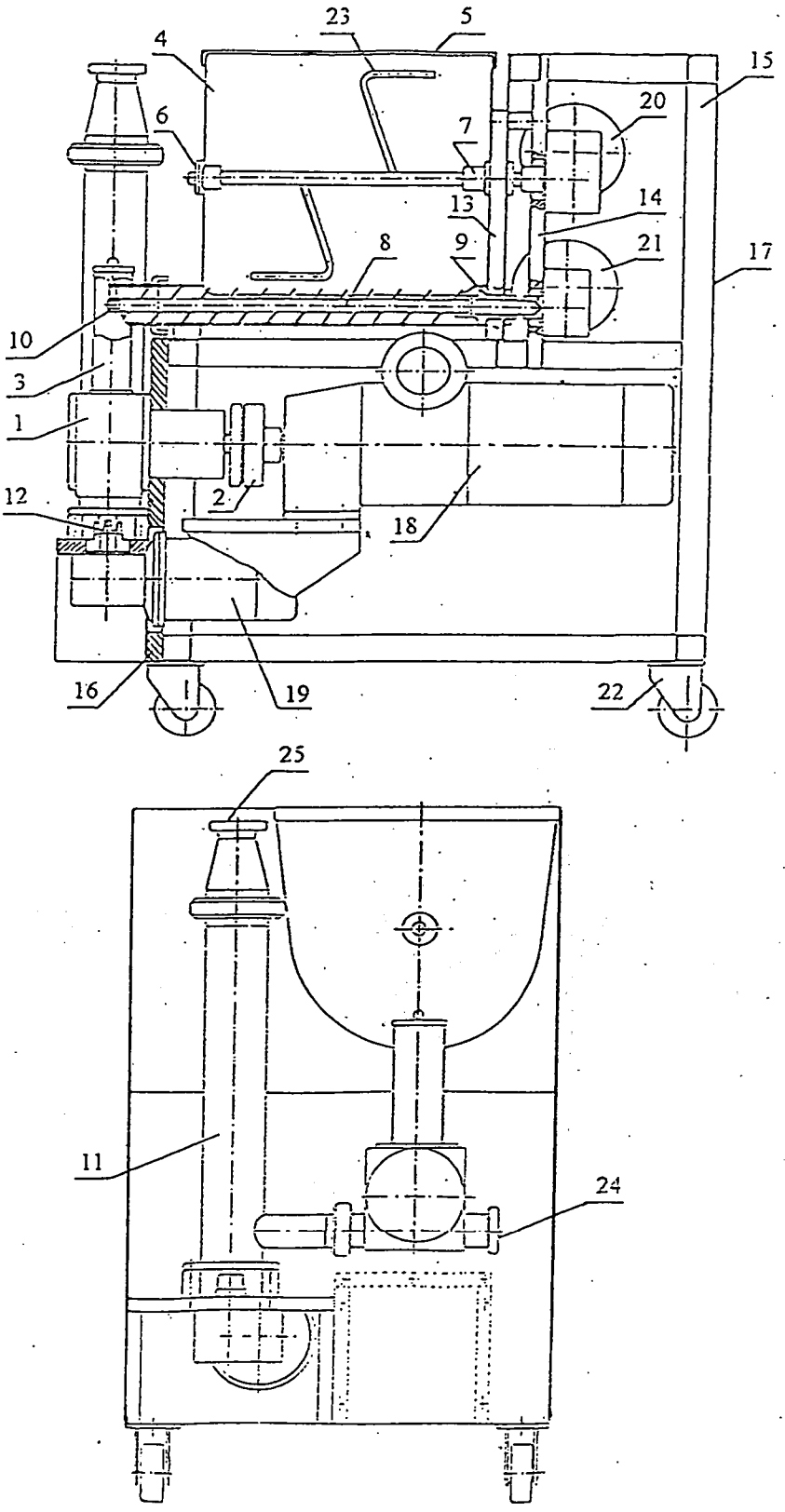
Worn out sleeves and sealings shall be replaced. In order to extend their life lubricate them by vase-line.
Service of drive systems shall be realized according to technical instructions contained in Part D: Enclosures.

X. TROUBLE-SHOOTING.

SYMPTOMS	REASON	REMEDY
Effluent of ice mass from under machine	Pump packing ring is untight	Repalce packing ring
Effluent of ice mass from under vertical mixer	Mixer teflon sleeve is untight	Repalce the sleeve
Effluent of ice mass through vertical channel of solid particles	Too small pump capacity	Increase pump capacity by turning the throttle lever counter-clockwise
	Worm out pump blades	Repalce pump blades

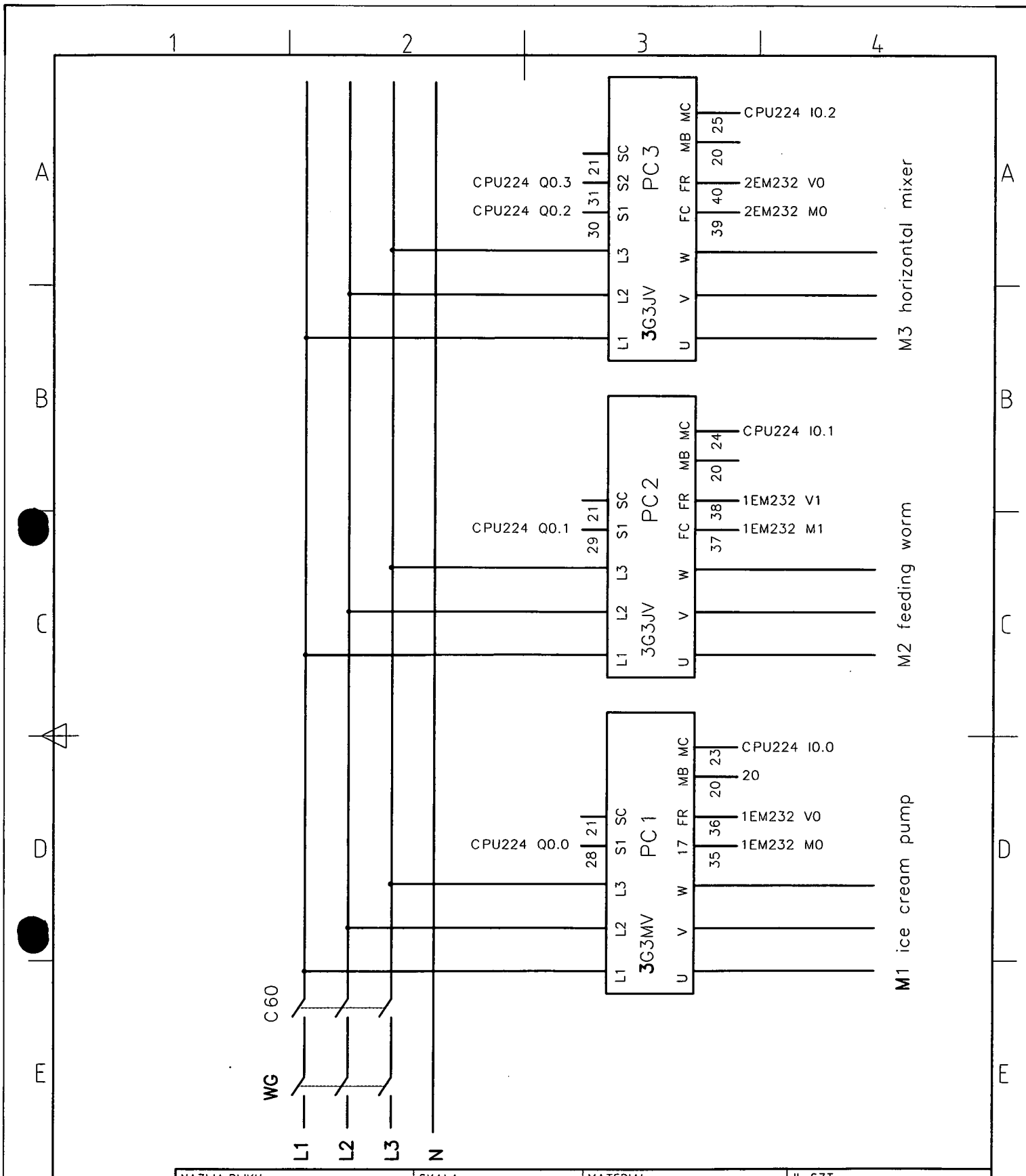
B. DRAWINGS

Drawing No. 1 : MACHINE STRUCTURE.

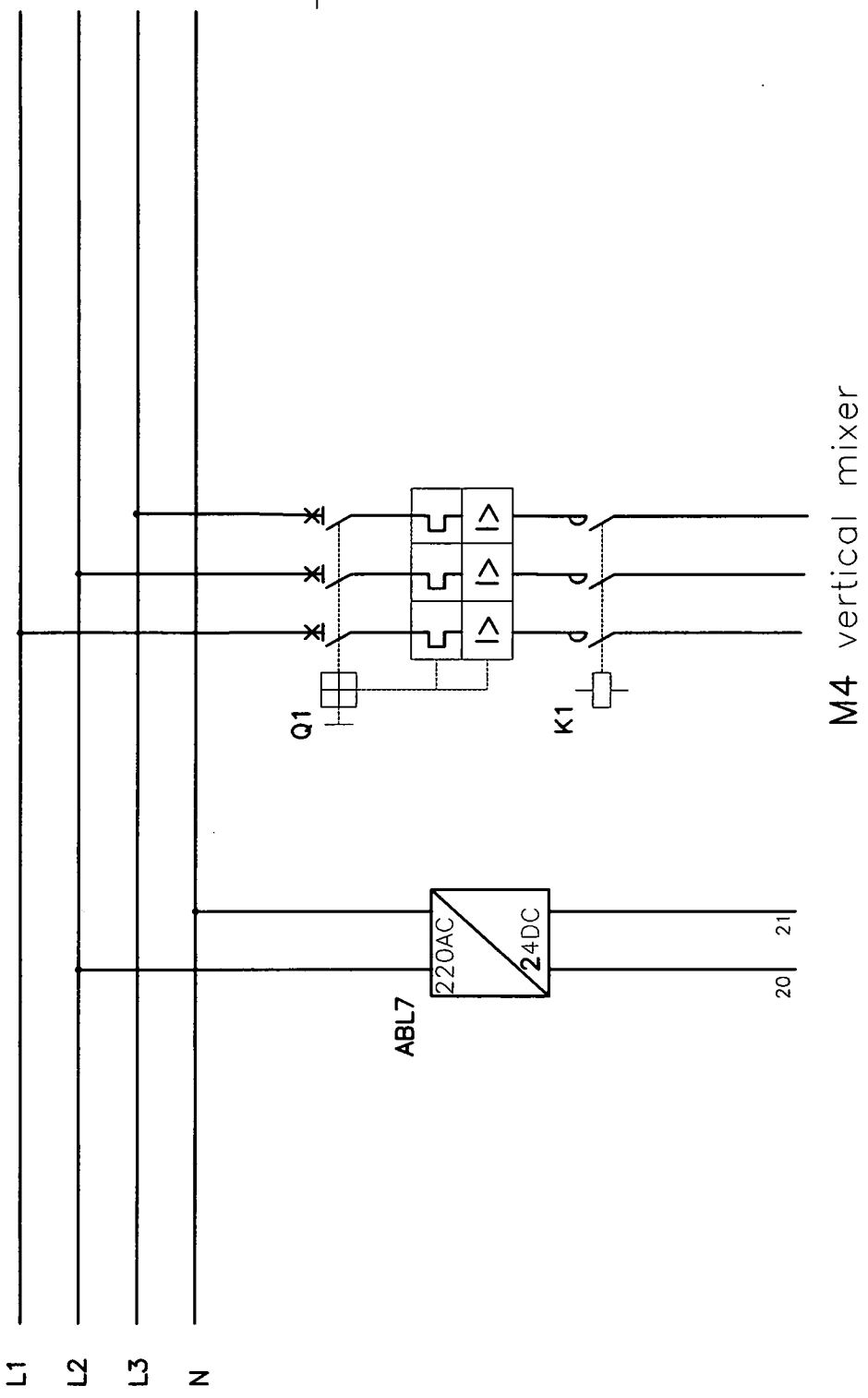


Markings at the Draw. 1.

1. Body of mass pump
2. Coupling
3. Vertical channel of solid particles
4. Container of solid particles
5. Flap of container of solid particles (with protection grid under the flap)
6. Front socket with teflon sleeve of solid particles mixer
7. Back socket with teflon sleeve of solid particles mixer
8. Feeding worm
9. Front socket with teflon sleeve of worm feeder
10. Back socket with teflon sleeve of worm feeder
11. Body of vertical mixer
12. Sealing of vertical mixer
13. Aluminium distance plate
14. Drive fixing plate
15. Machine frame
16. Aluminium front plate
17. Tin housing
18. Motor of mass pump
19. Motor of vertical mixer
20. Motor of solid particles mixer
21. Motor of worm feeder
22. Wheel with blocking
23. Blade of solid particles mixer
24. Entry stub pipe of ice mass
25. Exit stub pipe



NAZWA PLIKU	SKALA 1:1	MATERIAL	IL. SZT.
FORMAT A4		MASTER	
RYSOWAL 03-02-17 Krzysztof. Kalafarski			
SPRAWDZIL		Obwód zasilania	
ZATW.		Schemat elektryczny	
WYPROD.			
WER.		NR RYS.	
NR KONTRAKTU 533		FF-E-1	

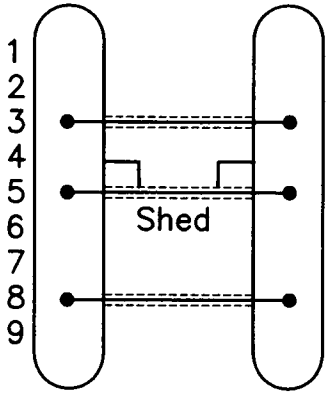


NAZWA PLIKU	SKALA 1:1	MATERIAL	IL. SZT.
FORMAT A4			
RYSOWAL 03-02-17 Krzysztof. Kalafarski		MASTER	
SPRAWDZIL		Obwód zasilania Schemat elektryczny	
ZATW.			
WYPROD.			
WER.		NR RYS. FF-E-2	
NR KONTRAKTU 533			

The maximum length for
the cable is 1200 meters

OP 7 Side

S7–200 Side



Transmit/Receive Data +

Logic Ground

Transmit/Receive Data –

Transmit/Receive Data +

Logic Ground

Transmit/Receive Data –

TD/CPU Cable without
Power Connectis

NAZWA PLIKU	
FORMAT A4	SKALA 1:1
RYSOWAŁ 02-10-28 Krzysztof Kalafarski	
SPRAWDZIŁ	
ZATW.	
WYPROD.	
WER.	
NR KONTRAKTU 533	

MASTER

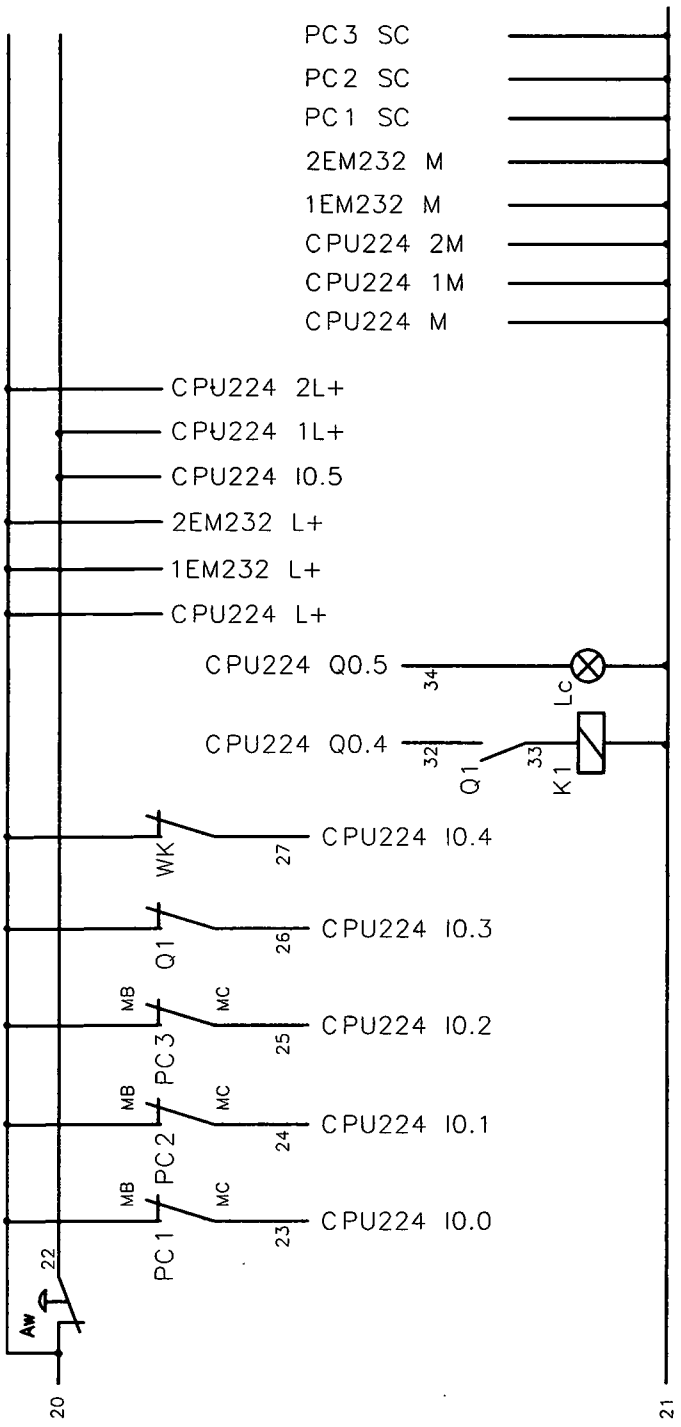
MATERIAL

IL. SZT.

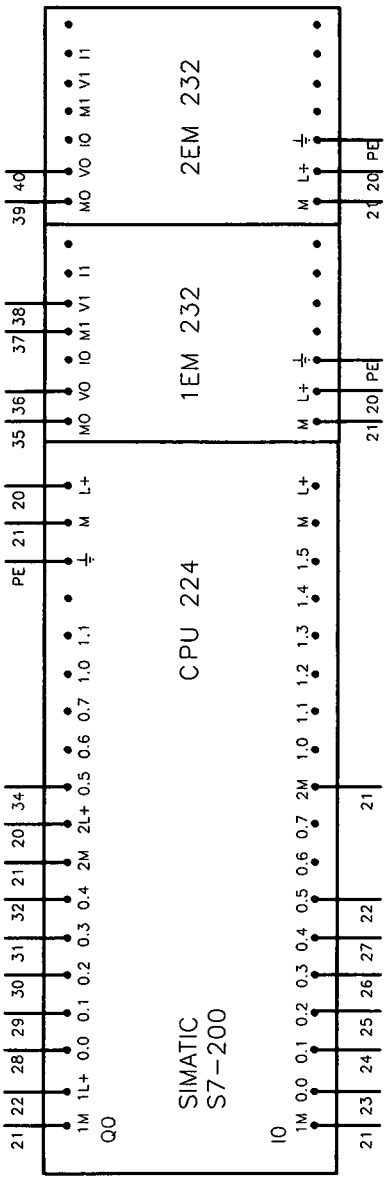
Połączenie S7 - OP7

Schemat elektryczny

NR RYS. FF-E-3



NAZWA PLIKU	SKALA 1:1	MATERIAL	IL. SZT.
FORMAT A4		master	
RYSOWAL 03-02-18 Krzysztof Kalafarski		Obwod sterujacy schemat elektryczny	
SPRAWDZIL			
ZATW.			
WYPROD.			
WER.		NR RYS.	
NR KONTRAKTU 533		FF-E-4 533	



NAZWA PLIKU	SKALA 1:1	MATERIAL	IL. SZT.
FORMAT A4		master	
RYSOWAL 03-02-18 Krzysztof Kalafarski		Obwod sterujacy	
SPRAWDZIL		schemat elektryczny monta?owy	
ZATW.			
WYPROD.		NR RYS.	
WER.		FF-E-5 533	
NR KONTRAKTU 533			

C. WARRANTY

ICE
group sc

POLAND, 44 - 203 Rybnik, Żorska 14
Tel. + 48 32 42 29 835
Tel. + 48 32 42 29 836
Tel. / Fax + 48 32 42 37 944
e-mail: icegroup@icegroup.pl

..... company name (Customer)

SZADA, date 11.04.2003
Place

MACHINE COLLECTION CONFIRMATION

MASTER 1200 nr 533

Hereby device has been commissioned and related to the customers disposal on the day .....

The training dealing with construction of the device, operation safety, adjustment methods, cleaning and maintenance
The training has been participated in by the following persons of the customer's personnel. These persons are qualified to operate the above devices.

Lp.	Name	Designation	Signature of the trained peson
1.	ISTVÁN JUHÁSZ		
2.			

Baldauf és Társa
Élelmiszeripari és Kereskedelmi Kft.
2111 Szada 089/3 HRSZ
Adószám: 10579967-2-13
Tel.: 06-28-404-621
Fax: 06-28-404-622

..... Signature of the customer

..... Signature of the service person

ATTENTION!
Non accepting the device causes that every fault of the machine emerged in operation does not undergo warranty rights.

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Tel. / Fax + 48 32 42 37 944
e-mail: icegroup@icegroup.pl

II. WARRANTY CARD.

Warranty period
12 months

MACHINE NAME MASTER 1200

SERIAL NUMBER 533

DELIVERY DATE .....

COMMISSIONING DATE 11.04.2003

*) delete inadequate

.....
(signature and seal of the seller)

ZAKŁAD USŁUGOWO-HANDLOWY
Krzysztof Kobylański
44-200 Rybnik, ul. Mickiewicza 7/38
NIP 642-101-31-96

.....
(signature of the commissioning service person)

Serwis: ICE group sc. 44-203 Rybnik, ul. Żorska 14
tel./ fax 0-32/ 423-79-44, 422-98-35,

ICE
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Tel. / Fax + 48 32 42 37 944
e-mail: icegroup@icegroup.pl

III. SERVICE ORDER CARD

1.Service order should be confirmed by fax. Please specify when the machine will be ready for repair.

2.Preparing the machine for the technitian arrival should include its cleaning anddrying. Please also ensure appropriate amount of ice cream, containers and lids for tests. Until teh work is completed at least one person of the customer should be available (name) ....., authorized to confirm the work carried out by the manufacturers service person.

3.The service person's waiting time for maachine readiness is included in the cost of the service regardless if the machne is within the warranty period or not. If there is a need for the technician to stay overnight this cost will also be included in the cost of the service.

4.Device type ..... Serial nr . ..... Year of production .....

Faulty element, part	Detailed description of damaged elements	Suggestions for the requirements of parts needed

.....
Service ordering person name (legible)

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groups sc

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Faulty element, part	Detailed description of damaged elements	Suggestions for the requirements of parts needed

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Service ordering person name (legible)

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4.Device type ..... Serial nr . ..... Year of production .....

Faulty element, part	Detailed description of damaged elements	Suggestions for the requirements of parts needed

.....

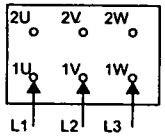
Service ordering person name (legible)

D. ENCLOSURES

– S(K,L)g(h) 80 ÷ 71-6/4 and 8/6 number of poles 2p = 6/4 and 2p = 8/6 (double-winding)

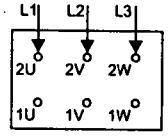
2p = 6 (8)

STAR CONNEXION



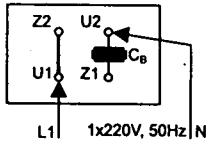
2p = 4 (6)

STAR CONNEXION

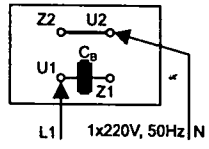


3. 1-phase induction motors type SE(M)(K,L)g(h) .. with run capacitor

clockwise rotation



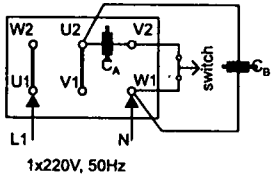
anticlockwise rotation



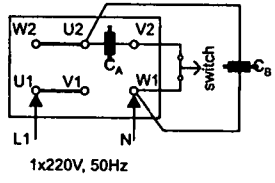
C_B - capacitor start

4. Single-phase induction motors type SE(M)(K,L)g(h) ..-..F with two capacitors - run, start and centrifugal switch

clockwise rotation



anticlockwise rotation



C_A - capacitor run
C_B - capacitor start

FABRYKA SILNIKÓW ELEKTRYCZNYCH
BESEL S.A.
49-300 BRZEG, ul. Elektryczna 8
tel. (+48) (77) 4162861-9 fax (+48) (77) 4166868
e-mail: besel@cantonimotor.com.pl http://www.besel.pl

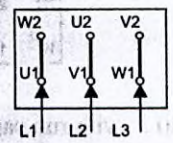
SERVICE AND EXPLOITATION INSTRUCTION MANUAL

for squirrel - cage induction motors:
three-phase,
single-phase with run capacitor,
series "g", "h"
general destination,
of frame size 56, 63, 71, 80, 90
according to requirements of
PN-EN 60034-1
IDT EN 60034-1; EQV IEC 60034-1

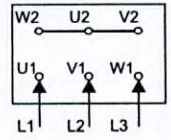
Annex No. 1

1. 3-phase single-speed induction motors type S(K,L)g (h)80 ÷ 71 numbers of poles:
   2p = 2, 2p = 4, 2p = 6, 2p = 8

DELTA CONNEXION

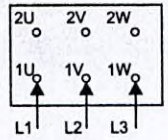


STAR CONNEXION

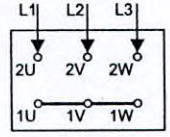


2. 3-phase two-speed induction motors type:
– S(K,L)g(h) 80 ÷ 71-4/2 and 8/4
numbers of poles: 2p = 4/2 and 2p = 8/4 (single-winding)

2p = 4(8)
DELTA CONNEXION

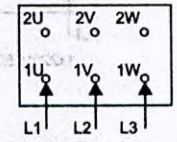


2p = 2(4)
DOUBLE-STAR CONNEXION

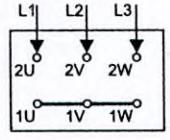


– S(K,L)g(h) 80 ÷ 71-4/2.W and 8/4.W
number of poles 2p = 4/2 and 2p = 8/4 (single-winding , for ventilator drive)

2p = 4(8)
STAR CONNEXION



2p = 2(4)
DOUBLE-STAR CONNEXION



6. STORAGE

Motors should be stored in dry airy containers free from gases, liquids and causting vapours which are harmful for the winding insulation and parts of the motor.

Motors must not be kept in rooms where fertilisers, chlorinated lime, aciors and chemical agents etc. are gathered. The temperature of the environment where motors are stored must not be lower than 278 K (+ 5°C) and relative humidity must not exceed 70 %.

Motors stored more than 2 years since the production date (after warranty period) should be renovated, what includes:

a) outside cleaning of the motor,
b) checking if bearings operate in a correct way and, if not, damaged bearings must be replaced,
c) measurement of the winding insulation resistance (in cool state) and if it is lower than 20 MΩ motors must be dried in a temperature not higher than 353 K (+80°C).

The shaft end must be protected against corrosion by the layer of corrosion preventing grease or easily removed varnish.

1. TECHNICAL DESCRIPTION

The squirrel-cage induction motors of frame size 56, 63, 71, 80, 90 are low power, enclosed motors. In standard execution they are in IP 54 degree of protection or IP 56 (as requested). They are intended for continuous running S1.

Parts of motor housing are made of aluminium alloy AK 11 apart from the fan cover which is made of steel sheet.

In the terminal box there is a terminal board which is used for connecting the motor to the mains and the neutral terminal which is used for neutral earthing or grounding of the motor. The terminal box is equipped with a gland M20x1,5 through which the power lead should be inserted and sealed.

In single-phase motors the capacitor made of metallized paper is connected in series with winding of auxiliary phase. It is also connected to terminals of the terminal board.

Motors are intended to work in a horizontal position of the shaft. They can work in perpendicular position, with the shaft end downwards or upwards provided the axial load of the bearings is not too large and originates from the weight of a rotor, a pulley or toothed wheel, relatively light clutch or the fan which is fixed on the motor shaft.

Marine motors can only work in a horizontal position with the terminal box upwards. That is because of the location of drain holes.

Motors are equipped with the self-cooling.

Maximal temperature of the environment, in which the motors operate, depends on the climatic execution and cannot be higher than

313 K (+ 40°C) for the temperate climate N/2, N/3 and the tropical climate TH/2 and TH/3,

318 K (+ 45°C) for the marine climate MU/2 and MU/3.

2. OPERATING CONDITIONS

Squirrel cage induction motors series „g" and „h" (frame size 56, 63, 71, 80, 90) are general destination products provided for driving various machines and devices.

The motor housing, made in the degree of protection IP 54 (IP 55 or IP 56), protects the motor from being penetrated by a solid body or water in the range defined in Polish Standard PN-IEC 60034-1. It is recommended to use a cover or a roof during long lasting exposure of the motor to rainfall. Draining of condensation water every 12 months, while exploiting under difficult conditions every 3 months.

Marine motors made according to the requirements of Polish Register of Shipping are manufactured in the degree of protection IP 55.

Direct-on starting is used in motors. They can operate when voltage deviations do not exceed ± 10% of the motor rated voltage. All of the rated data refer to the rated voltage.

If voltage deviations exceed ± 10 % of the rated voltage motors should not be started. This rule can be omitted only if motor has a suitable heat reserve for the specific application. Maximal heating temperature of the motor winding can not exceed + 155°C (for insulation class F). Having carried out tests only the branch specialist can decide about it; using Polish Standard PN-89/E-05012 is recommended.

Each motor must be protected against overload and short-circuit by protections selected by an user in accordance with Polish Standard PN-89/E-05012 and recommendations of BESEL.

You must not operate the motor which is not neutralised or without protective grounding as it may cause electric shock.

Parts of driven device coupled to the motor shaft directly should be balanced dynamically with an accuracy of 5 μm, not less.

2.1. ACTIVITIES BEFORE THE INSTALLATION OF A MOTOR

Before you mount the motor to a motored device:

a) check if the rotor turns freely,
b) check if parts of the device which is coupled to the motor shaft are balanced dynamically with the required accuracy,
c) put on parts of a motored device sliding or pushing them lightly without exerting pressure on bearings. Otherwise you will cause damage. At the same time the motor shaft should be supported on the non-drive end stiffly so that the pressure should not cause either damage of bearings or damage of a spring washer which cancels axial play of the rotor,
d) after fixing the motor in a device check whether there is the minimal distance (14 mm) between the fan cover and other parts, whether the holes in the cover are not stopped down.

Caution:
Access of cooling air to the motor housing cannot be made difficult.

5. TRANSPORT

Motors must be transported only under cover that protects them against getting wet or damp.

Motor cartons should guarantee appropriate protection against mechanical damages, shocks and dust.

During transport they should guarantee proper protection against damages of the shaft end, terminal box, fan cover and varnish coat.

Motors should be transported in crates, metallic pallets or carton boxes. Motors must not move inside containers which must be stuck.

5.1. MOTOR WEIGHTS

Motor weights are different for different types of the same frame sizes - according to output, different mounting systems and other added specific details.

The table below contains maximal (approximate) motor weights as function of stacking length (A,B,C).

Frame size of motors	Motors				
	3-phase		1-phase		
	A	B	A	B	C
56	3,0	3,4	3,0	3,5	3,9
63	3,6	4,2	3,8	4,4	5,2
71	5,3	6,2	–	6,8	8,0
80	7,9	9,4	8,5	10,6	12,4
90	–	–	12,0	13,6	–

You can receive more accurate weights for particular motors in BESEL.

with insulating varnish and dried in the temperature not higher than 373 K (+ 100°C),

b) checking of insulation resistance between particular phases of the windings and between windings and a motor housing,
c) in case of repair of the windings (re-winding the resistance of the winding insulation should be checked according to the previous item, afterwards a high-voltage test must be carried out. The test is conducted by using proof voltage (2U + 1000) × 0,8 for a minute between particular phases of the windings as well as between the windings and a neutral terminal of proof voltage. The high-voltage test is not carried out if winding damage was not found and repaired during an inspection.

Caution:
A high-voltage test can be conducted only by a specialist who has required authorisation.

e) motor reassembling. Motor reassembling is performed in reverse order than the disassembly. All activities connected with disassembly, inspection and reassembling should be performed without damaging of windings and other parts of the motor.

4. ACCEPTANCE TEST AFTER INSPECTION OR REPAIR

After inspection and remounting the motor should be subjected to the following examinations:
a) to measure winding resistance,
b) to control if the connexions are correct,
c) to measure insulation resistance in cool state,
d) to carry out a 2 hours' no-load running test of the motor and if it is possible to carry out a test of a rated loaded motor:

The test must be long enough for the motor temperature to stop rising in a visible way.
The above researches must be conducted according to the PN-EN 60034-1.

2.2. CONNECTING THE MOTOR TO THE MAINS

2.2.1. Three-phase motors made for voltage base 220/380 V or 220 ÷ 240 / 380 ÷ 420 V can be connected:

a) to the mains with line-to-line voltage: 3 x 380 V, 3 x 380-420 V when the motor winding is star connected,
b) to the mains with line-to-line voltage: 3 x 220 V, 3 x 220-240 V when the motor winding is delta connected.

Three-phase motors of frame size 80, 71 are made as:
a) single-speed with the pole number 2p = 2, 4, 6, 8
b) two-speed with the pole number:

- 2p = 4 / 2, 2p = 8 / 4 — single-winding
- 2p = 8 / 6, 2p = 6 / 4 — double-winding

and with other number of poles - as requested.

Three-phase motors of frame size 63 and 56 are made as:
a) single-speed with pole number 2p = 2, 4.

The ways of winding connection and connecting them to the mains are presented on wiring diagrams in the annex No. 1 of this Manual. The wiring diagram is on the inside of the lid of a terminal box. Motors made for specific voltages can be connected to the mains with line-to-line voltage corresponding to the voltage placed on a rating plate.

2.2.2. Single-phase motors with run capacitor made for the voltage 220 V 50 Hz can be connected to the mains of voltage 220 V 60 Hz

Single-phase motors with a run capacitor , frame size 56, 63, 71, 80 and 90 are made as single-speed with the number of poles 2p = 2 and 2p = 4.

The winding and capacitor connexions on the terminal board , connecting them to the mains for clockwise and anticlockwise rotation are presented on wiring diagrams on the annex No.1 of this Manual. Wiring diagrams are on the inside of the lid of a terminal box.

Motors made for specific voltages can be connected to the mains of rated voltage corresponding to the voltage marked on the rating plate of the motor.

2.2.3. Before you connect the motor check:

a) if the rated voltage of the motor corresponds to voltage of the mains (deviations of the voltage of the mains cannot exceed ± 10 % of the rated voltage),
b) if winding connections on the terminal board are consistent with a wiring diagram ,
c) if neutral earthing and protective grounding of the motor is correct and firm,
d) if the motor has the right overload protection (thermal),
e) if the motor has the right protection against short circuit (a fuse or an electromagnetic breaker),
f) if resistance of the motor insulation in the cool state is not lower than 20 Mohm,
g) if the direction of motor rotation is consistent with the direction of motored device rotation , in typical motors the direction is clockwise when you look from the shaft end,
h) if the capacitor (in single-phase motors) is not damaged (that is, whether the capacitor cover is not damaged or if there are not any dents).

Cautions:

1. In case of moistening (when the resistance of the motor insulation is lower than 20 Mohm) dry in the temperature not higher than 353 K (+ 80°C).
2. Neutral earthing of the motor must be made by connecting a neutral wire to a neutral terminal on the marked riser head, which is placed on the motor housing inside the terminal box.
3. When the motor operates pay attention to how it works and disconnect the motor from the mains in following cases:
   – over-oscillation of the motor (excessive oscillation),
   – considerable decrease of rotational speed,
   – overdue heating of the motor or bearings.

3. PERIODICAL INSPECTIONS AND MAINTENANCE OF A MOTOR

Each operating motor should be inspected periodically:
– minor inspection - every 12 months,
– main inspection :
  – motors of synchronous rotational speed n_s = 3000 rpm after 4000 working hours ,
  – motors of synchronous rotational speed n_s = 1500 rpm after 6000 working hours

  – motors of synchronous rotational speed

$$\left.\begin{array}{l} n_s = 1000 \text{ obr/min} \\ n_s = 750 \text{ obr/min} \end{array}\right\} \text{– after 7000 working hours}$$

but at least every 3 years

3.1. MINOR INSPECTION

Minor inspection includes the following activities:
a) visual inspection and cleaning of the motor and protecting apparatus without disassembly if visual inspection does not reveal such necessity,
b) measurement of the resistance of motor winding insulation,
c) measurement of the effectiveness of neutral earthing or the resistance of protective grounding,
d) measurement of the resistance of feed installation insulation,
e) draining of condensation water:
in order to drain condensation water unplug the rubber plug from a drain hole;
in IP 55 execution it is in the drive end shield, in IP 56 execution in the drive and nondrive end shield.

3.2. MAIN INSPECTION

Main inspection includes the following activities:
a) disassembly of the motor consists in performing operations mentioned below in the following order:
  – unscrewing of the three screws that fasten the fan cover
  – removing of the fan from the shaft by means of a puller,
  – unscrewing of the three bolts that fasten bearing shields,
  – removing or bearing shields by means of special bearing puller or by tapping a wooden hammer on riser heads that stick out of shields,
  – removing of the motor and bearings,
  – taking off bearings from the motor shaft by means of a bearing puller only in case they must be replaced (they are damaged or used up).
In motors two ball bearings type 2Z are applied. They do not need lubricating (bearings are lubricated during manufacturing).
b.) checking the conditions of a stator winding which must be cleaned carefully and blown through with compressed air. On winding ends there must not be any damaged places , windings ends must be stiffen. They should be covered

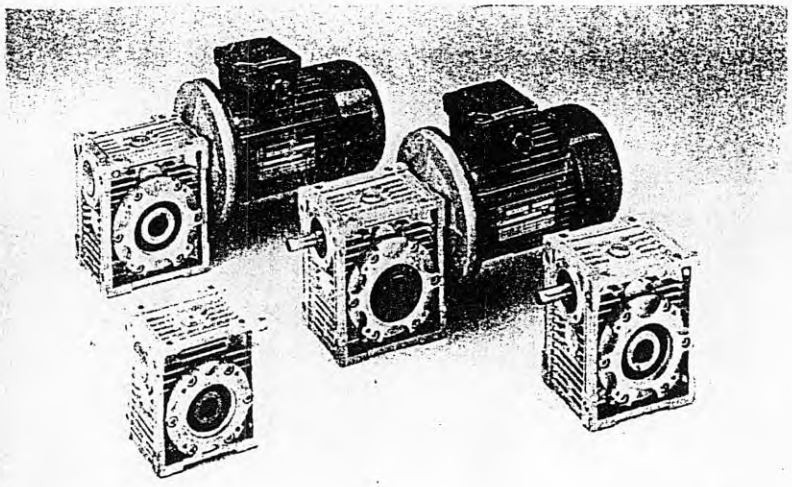
MOTOVARIO

DOCUMENTATION

TECHNIQUE

des motoréducteurs à vis sans fin

Motovario (Italie)



REDUCTEURS – MOTOREDUCTEURS

IMPORT · EXPORT · SERVICE

EQNet

THE EUROPEAN NETWORK FOR QUALITY SYSTEM ASSESSMENT AND CERTIFICATION

This is to state that

MOTOVARIO S.p.A.

Via Giardini, 45 - 41040 Spezzano di Fiorano Modenese (MO)
Italia

holds the Quality System Certificate

CISQ-ICIM n°: 0129/0

for the standard from the
ISO 9000 / EN 29000
series, and the scope as specified therein

Signed for and on behalf of EQNet member

DATE

08-11-1993

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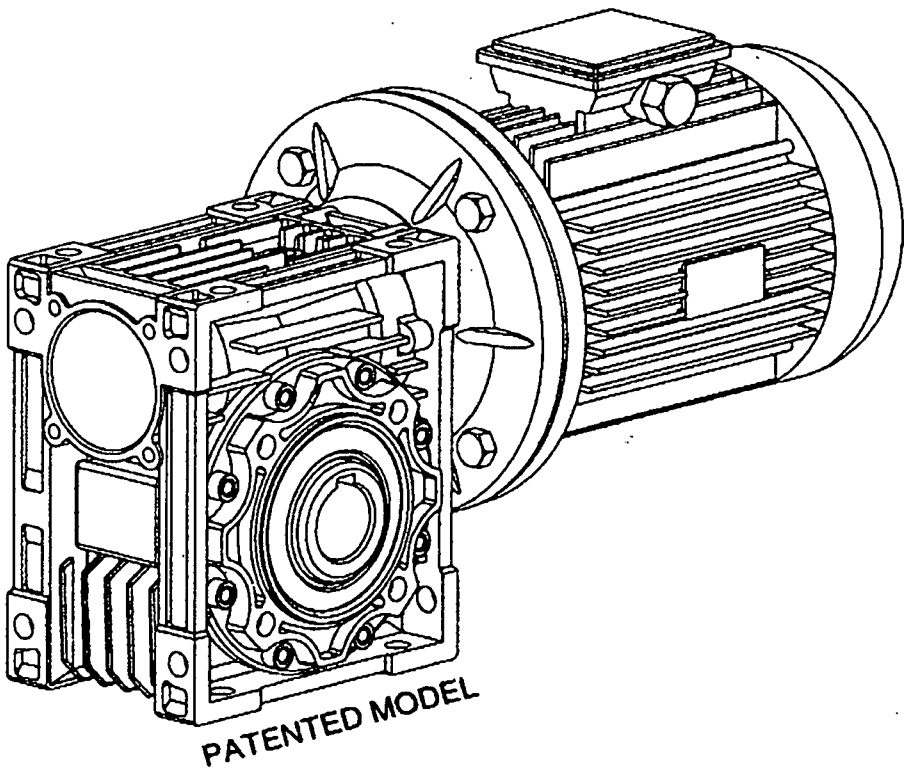
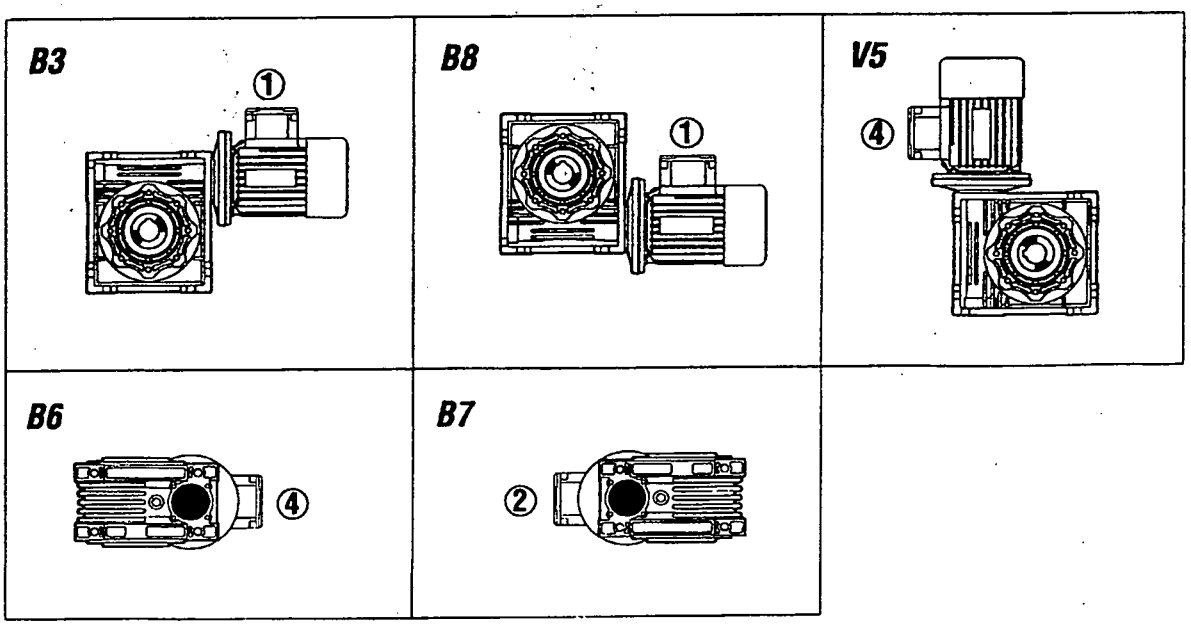
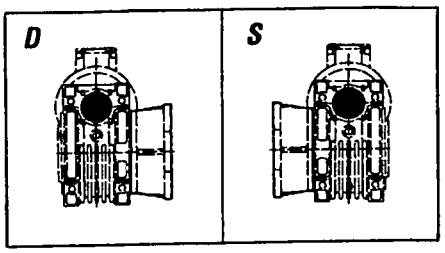
MOTOREDUCTEURS A VIS SANS FIN

NMRV

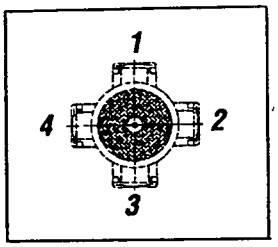


POSITIONS DE MONTAGE





POSITIONS DE MONTAGE FLASQUE-BRIDE „F-FL"
Sauf indication contraire au moment de la commande, le réducteur est normalement livré avec la flasque-bride en position D par rapport à la position de montage B3.



EMPLACEMENT BORNIER
Sauf indication contraire au moment de la commande, le bornier est monté comme indiqué dans le schéma.

1. DESIGNATION.

NMRV	motoréducteur
NRV	réducteur
025 ÷ 090	grandeur
F - FL	flasque en sortie
030	rapport
PAM	flasque d'adaptation prévue
200	diamètre flasque
19	diamètre arbre
VS	vis à double sortie
AS	un bout d'arbre de sortie
AB	deux bouts d'arbre de sortie
B3	position de montage
0,75 kW	puissance moteur
4p	nombre de poles
V220/380	tension
Hz50	fréquence

2. CONSTRUCTION.

- Fixation universelle.
- Carter breveté, de conception moderne.
- Ailettes de refroidissement largement dimensionnées.
- Excellente conductibilité thermique avec grande dissipation de chaleur.
- Profil Zl (UNI 4760) avec profil vis rectifié.
- 9 grandeurs pour des puissances s'échelonnant de 0,06 à 9,2 kW.
- Rapports de réduction compris entre 5 et 100.
- Rendement élevé.
- Excellente résistance mécanique alliée à une remarquable légèreté.
- Exécution carter perforé (auto-drainage).

3. MATERIAUX.

- Carcasses: en alliage d'aluminium.
- Vis: en acier 20MnCr5 (UNI 8550) cémenté, trempé, rectifié.
- Roue hélicoïdale: en bronze G-CuSn12 (UNI 7013-72).

4. PERFORMANCES.

Capacités de charge et rendements: calculés selon BS 721-83 vérifiés selon Niemann.

5. LUBRIFICATION.

Les réducteurs gr. 025, 030, 040, 050, 063, 090 sont livrés lubrifiés à vie à l'huile synthétique IP TELIUM VSF. En conséquence, ils peuvent être montés dans toutes les positions.
L'huile synthétique adpotée par Motovario peut être employée par température ambiante comprise entre -25°C à +50°C.

Quantité huile en l						
NRV	025	030	040	050	063	090
B3	0,02	0,04	0,08	0,15	0,30	1
B8						
B6, B7						
V5						

Type	Minérale	Synthétique
IP	MELLANA OIL 320	TELIUM VSF
SHELL	OMALA OIL 320	TIVELA OIL SC320
AGIP	BLASIA-320	BLASIA S320
MOBIL	MOBILGEAR 320	GLYGOYLE 30
CASTROL	ALPHA MAX 220	ALPHASYN PG 320

6. PROFIL DE LA VIS SANS FIN.

Les performances du couple vis/roue dépendent de defférents facteurs, tels que matériaux utilisés, lubrification, construction. De tote façon, l'étude du couple à travers une analyse de la zone de contact en fonction du profil et de la fraise-mère utilisé pour le taillage de la roue à gorge est fondamentale.
C'est pourquoi MOTOVARIO a adopté pour les vis sans fin le profil ZI (UNI 4760/4).
Les performances élevées du réducteur MOTOVARIO (couples transmissibles, rendements, fiabilité) passent donc par une étude minutieuse des profils et par une analyse approfondie des caractéristiques de l'outil de taillage (fraise-mère) et, par conséquent, par une détermination précise des zones de contact optimales.

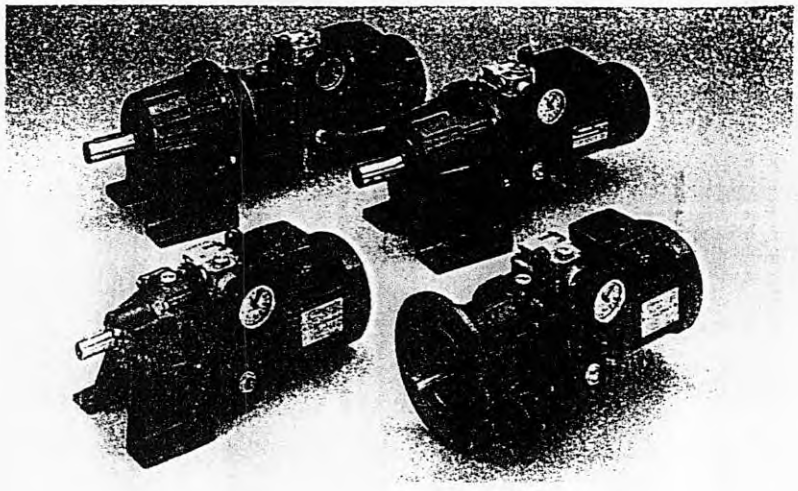
MOTOVARIO

DOCUMENTATION

TECHNIQUE

des motovariateurs

Motovario (Italie)



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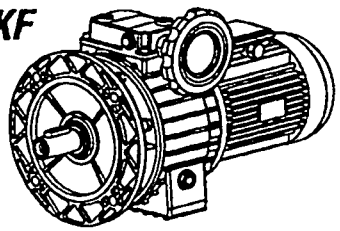
MOTOVARIATEURS

TKF



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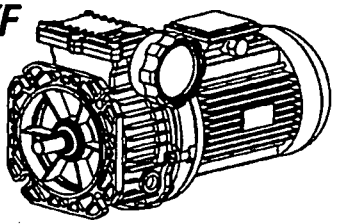
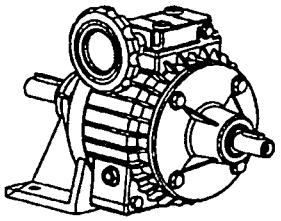
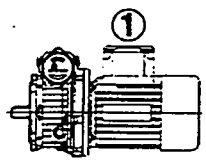
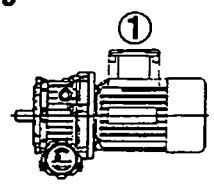
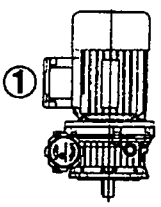
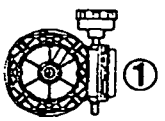
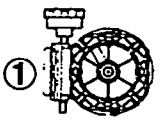


VK

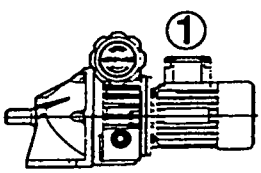
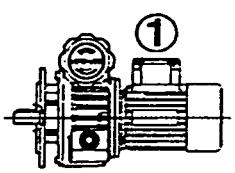
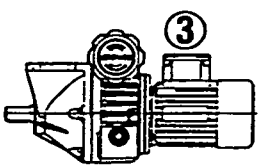
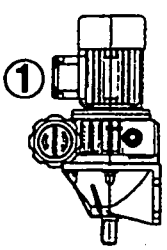
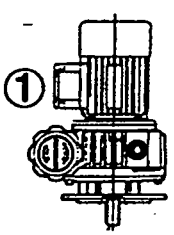
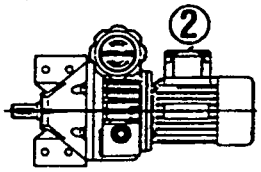
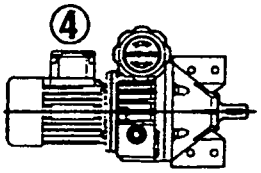


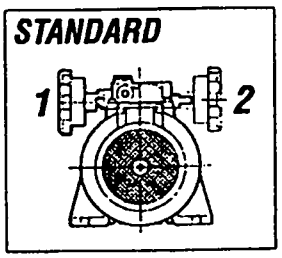
POSITIONS DE MONTAGE

TX

B5	B8	V1	B6	B7
				

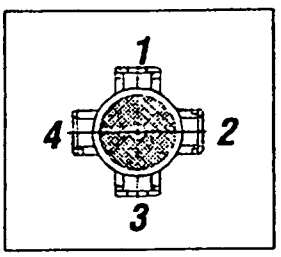
TK

B3	B5	B8
		
V5	**V1**	
		
B6S	**B6D**	
		



COMMANDE MANUELLE

Les variateurs sont livrés de série équipés d'une commande de variation de vitesse manuelle à volant. Sur demande, possibilité de monter un indicateur gravitationnel sur le volant. Le volant de commande est livré, sauf indication contraire, monté sur le variateur en pos. 1 (volant à droite en observant l'arbre de sortie par devant).



EMPLACEMENT BORNIER

Sauf indication contraire au moment de la commande, le bornier est monté comme indiqué dans le schéma.

1. DESIGNATION.

TKF	variateur avec flasque en sortie
TXF	motovariateurs
VK	variateur avec arbre d'entrée
D	différentiel
002, 005, 010	grandeur
170-1000	vitesse de sortie
B3, B5, B8	position de montage
0,75 kW	puissance moteur
4p	nombre de poles
V220/380	tension
Hz50	fréquence

2. CONSTRUCTION.

- Grandeurs (autrement dit tailles): 7 pour des puissances s'échelonnant entre 0,15 et 9,2 kW.
- Plage de variation: i=3,5 (5/080 ÷ 10/090); i=6 (gr. 5 ÷ 10); i=5 (autres tailles).
- Plage de variation avec différentiel: i=∞.
- Fonctionnement silencieux, exempt de vibrations.
- Rendement élevé.
- Rotation dans les deux sens.
- Volant de commande positionnable sur les deux côtés.
- Répétabilité au nombre de tours maxi.: ± 0,5 %.
- Répétabilité au nombre de tours mini.: ± 1 %.
- Sensibilité de réglage: 0,5 tr/min.

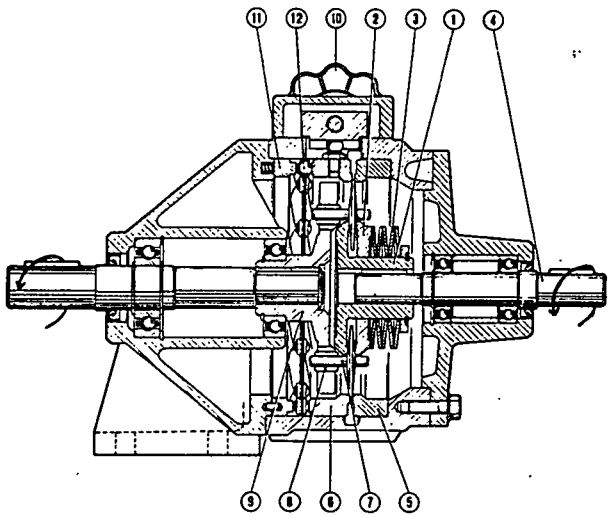
3. MATERIAUX.

- Carcasses (TK-VK): en fonte grise G200 (ISO 185).
- Carcasses (TX): en alliage d'aluminium coulé sous pression.

4. MOTEURS ELECTRIQUES.

- Toutes les versions: au degré de protection IP55.
- Versions TK (gr. 2-5-10): position de montage B14.
- Versions TX (gr. 20-30-50-100): position de montage B5.

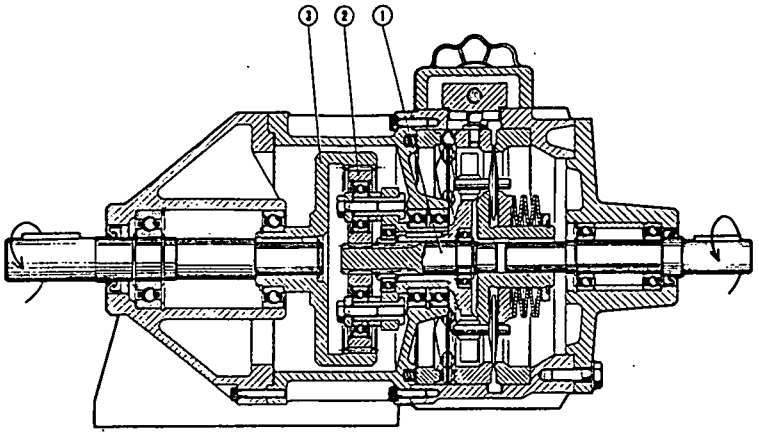
5. FONCTIONNEMENT.



Le motovariateur MOTOVARIO est constitué essentiellement par deux pistes internes (Rep. 1 et 2), maintenues par des rondelles „Belleville" (Rep. 3) calé es sur l'arbre moteur (Rep. 4) et par deux pistes externes (Rep. 5 et 6) faisant corps avec la carcasse ainsi que par un nombre suffisant de satellites (Rep. 7) supportés par des douilles coulissant radialement dans le porte-satellites (Rep. 9) qui fait office de collecteur du mouvement.
Les satellites sont en contact avec les pistes internes qui leur transmettent le mouvement et avec les pistes fixes. Les satellites ainsi bridés ont un double mouvement: l'un de rotation autour de leur propre axe, l'autre de révolution autour des pistes internes, assimilé par le porte-satellites solidaire de l'arbre de sortie.
La variation du mouvement s'obtient en agissant sur le volant de commande (Rep. 10) du déplacement angulaire de la piste (6) qui repose, au moyen d'une cage à billes (Rep. 12), sur la piste de butée à cames (Rep. 11).
Ce déplacement tend à modifier l'écartement entre les pistes (Rep. 5 et 6) variant ainsi le déplacement radial des satellites et modifiant de la sorte le mouvement respectif transmis au porte-satellites.

N.B.: La commande de variation de vitesse doit se faire uniquement en marche.

6. DIFFERENTIEL.



Le motovariateur MOTOVARIO pet être livré équipé d'un groupe épicycloïdal/différentiel qui permet une variation de la vitesse en sortie de zéro àla vitesse maximale prévue.
Ce rapport peut être défini = ∞.
Cela est possible du fait que la vitesse constante en entrée au variateur est également transmise au pignon (Rep. 1) d'entraînement du réducteur épicycloïdal. La vitesse constante d'entrée est transformée en une vitesse variable du variateur puis retransmise aux satellites (Rep. 2) du réducteur épicycloïdal. De cette façon, la vitesse des satellites (Rep. 2) et la vitesse du pignon d'entraînement (Rep. 1) sont égales; dans ces conditions, la vitesse de la couronne externe est nulle et, par conséquent, le nombre de tours sur l'arbre de sortie est égal à zéro.

7. LUBRIFICATION.

Série TK – Les gr. 002 et 005 sont fournies sans bouchons d'évent.
Série TXF – Les gr. 002, 005 et 010 sont fournies sans bouchons pour l'huile et avec lubrification permanente; elles n'ont donc besoin d'aucun entretien et/ou de vidange d'huile.
Tous les variateurs sont fournis, sauf indications contraires pendant la phase de commande, adaptés pour le fonctionnement en pos. B3-B5.
Pour les appionts éventuels, utiliser les types d'huile recommandés dans le tableau.

Quantité huile en l		
TKF	B3, B5, B6, B8	V1, V5
002	0,12	0,26
005	0,15	0,75
010	0,42	1,70

Quantité huile en l		
TXF	B5, B6, B7	V1, B8
002	0,10	0,25
005	0,13	0,40
010	0,33	0,75

Type de lubrifiants préconisés	
IP	TRANSMISSION V.E.
IP	A.T.F. DEXRON FLUID
AGIP	A.T.F. DEXRON
BP	AUTRAN DX
CHEVRON	A.T.F. DEXRON
ESSO	A.T.F. DEXRON
FINA	A.T.F. DEXRON
MOBIL	A.T.F. 220
SHELL	A.T.F. DEXRON
CASTROL	TQ DEXRON II

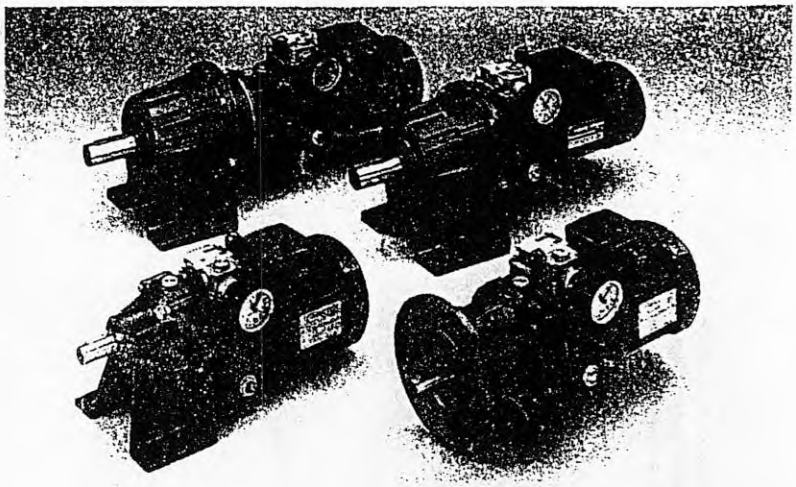
MOTOVARIO

DOCUMENTATION

TECHNIQUE

des motoréducteurs à engrenages cylindriques

Motovario (Italy)



REDUCTEURS – MOTOREDUCTEURS

IMPORT · EXPORT · SERVICE

EQNet

THE EUROPEAN NETWORK FOR QUALITY SYSTEM ASSESSMENT AND CERTIFICATION

This is to state that

MOTOVARIO S.p.A.

Via Giardini, 45 - 41040 Spezzano di Fiorano Modenese (MO)
Italia

holds the Quality System Certificate

CISQ-ICIM n°: 0129/0

for the standard from the
ISO 9000 / EN 29000
series, and the scope as specified therein

Signed for and on behalf of EQNet member

DATE

08-11-1993

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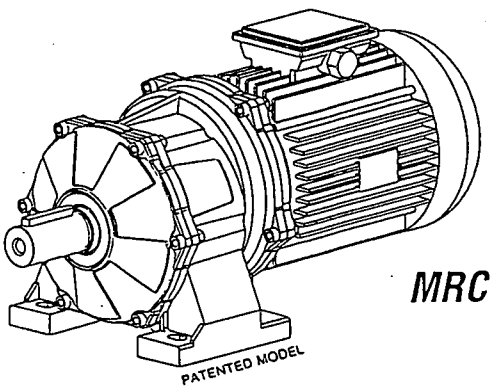
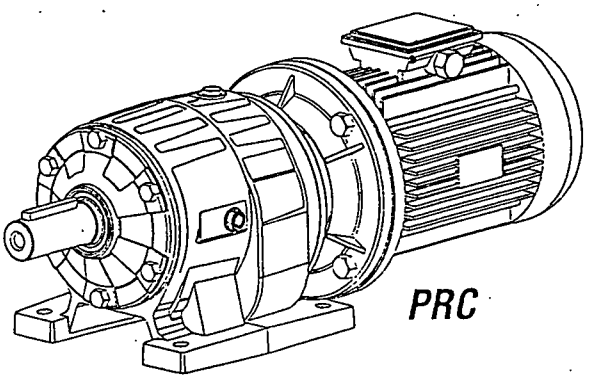
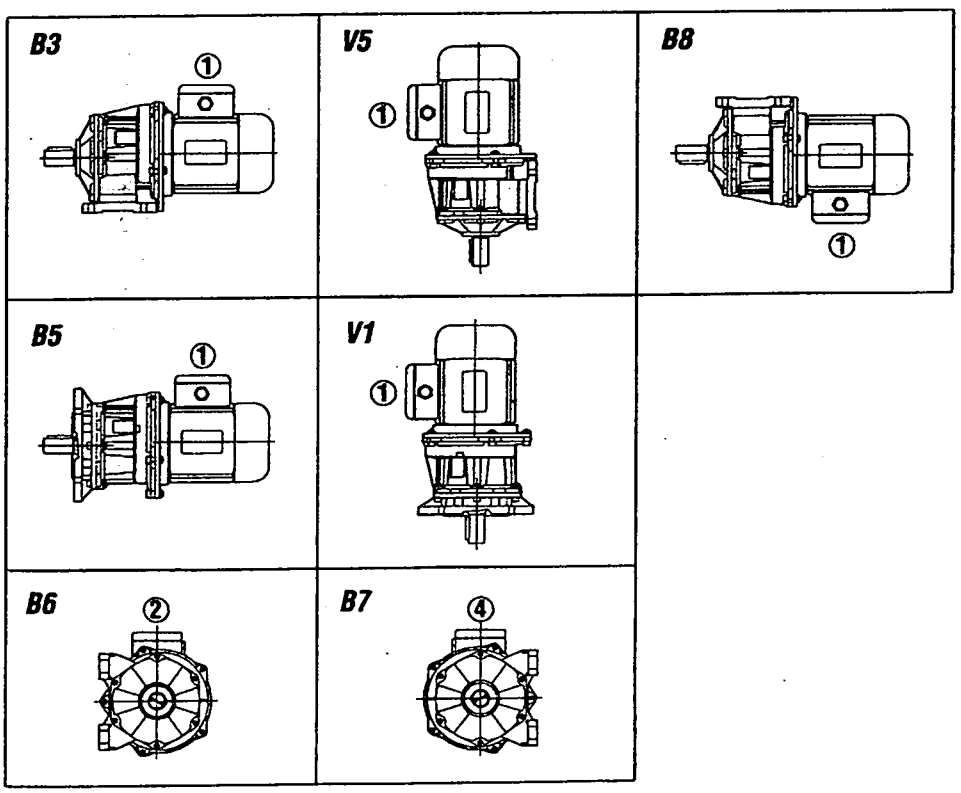
The issuing member holds all other EQNet members harmless for any claims arising from the existence of this document

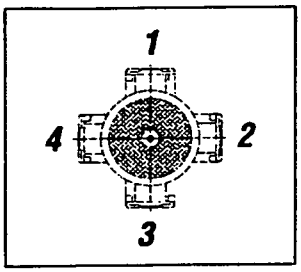
MOTOREDUCTEURS A ENGRENAGES CYLINDRIQUES





POSITIONS DE MONTAGE





EMPLACEMENT BORNIER

Sauf indication contraire au moment de la commande, le bo-rnier est monté comme indiqué dans le schéma.

1. DESIGNATION.

MRC	motoréducteur compact
PRC	motoréducteur
RC	réducteur
052, 061	grandeur
F - FL	flasque en sortie
2	nombre d'étage
12,7	rapport
B3	position de montage
PAM	flasque d'adaptation prévue
200	diamètre flasque
19	diamètre arbre
0,75 kW	puissance moteur
4p	nombre de poles
V220/380	tension
Hz50	fréquence

2. CONSTRUCTION.

- 8 grandeurs pour des puissances s'échelonnant 0,06 à 30 kW.
- Train à 1, 2, 3 étages de réduction.
- Engrenages rapides à denture rectifiée.
- Excellente résistance mécanique alliée à une grande légéreté.
- Rapports de réduction compris entre 2 et 250.
- Rendement élevé.
- Engrenages lents à denture „shavée" (rasée) ou rectifiée.
- Couples de sortie transmissible de 40 à 6000 Nm.

3. MATERIAUX.

- Carters (du 03 au 06): en alliage d'aluminium; (du 08 au 16): en fonte grise G200 (ISO 185).
- Arbres GV et arbres PV: en acier 2OMnCr5 (UNI 7846) cémenté et trempé.
- Engrenages: en acier 2OMnCr5 (UNI 8550) cémenté et trempé.

4. PERFORMANCES.

Capacité de charge calculée selon ISO 6336 et vérifiées selon AGMA 2001-B88.

5. LUBRIFICATION.

Les réducteurs sont livrés lubrifiés à l'huile minérale IP MELLANA OIL 220.
La quantité de remplissage se rapporte à la position de montage B3, B5.
Pour les grandeurs 052, 061, toujours préciser la position de montage si autre que B3, B5.

Quantité huile en l		
	PRC 052	MRC 061
B3, B5	1,2	1,6
B8		
B6, B7		
V5, V1	1,3	2,1

Type	**Minérale**
IP	MELLANA OIL 220
SHELL	OMALA OIL 220
AGIP	BLASIA 220
MOBIL	MOBILGEAR 220
CASTROL	ALPHA MAX 220

Einsatz der SIMATIC HMI Geräte in explosionsgefährdeten Bereichen

Zulässiger Einsatzbereich

Die SIMATIC HMI Geräte OP7, OP15, OP17, OP27, OP37, TP27-6, TP27-10, TP37, TD17 und MP270 erfüllen die Bauartanforderungen der EN 50021:1999 für elektrische Betriebsmittel zum Einsatz in explosionsgefährdeten Bereichen der Zone 2 sowie der EN 50281-1-1:1998 für elektrische Betriebsmittel zum Einsatz in explosionsgefährdeten Bereichen der Zone 22.

Zulässige Umgebungstemperatur

Der zulässige Umgebungstemperaturbereich bei senkrechtem Einbau beträgt:

Operator Panels OP7, OP17, OP27 Touch Panels TP27-6, TP27-10 Text Display TD17 Multi Panel MP270 TFT	0 °C ≤ T_A ≤ 50 °C
Operator Panels OP15, OP37 Multi Panel MP270 STN	0 °C ≤ T_A ≤ 45 °C
Touch Panel TP37	4 °C ≤ T_A ≤ 45 °C

Warnung

Die Montage der SIMATIC HMI Geräte muss so erfolgen, dass mindestens die Schutzart IP 54 gewährleistet wird. Ein Aufheben der Schutzart während des Betriebes der Gesamtanlage z. B. zu Wartungszwecken ist nicht zulässig!

Das Öffnen der Verschlussklappe für das Diskettenlaufwerk am OP37 darf nur erfolgen, wenn keine explosionsfähige Atmosphäre vorhanden ist!

Für Wartungsarbeiten muss ebenfalls sichergestellt werden, dass keine explosionsfähige Atmosphäre vorhanden ist!

Using SIMATIC HMI devices in explosive areas

Authorized area of usage

The SIMATIC HMI devices OP7, OP15, OP17, OP27, OP37, TP27-6, TP27-10, TP37, TD17 and MP270 meet the design requirements of EN 50021:1999 for electrical apparatus for use in Zone 2 explosive areas and EN 50281-1-1:1998 for electrical apparatus for use in Zone 22 explosive areas.

Permissible ambient temperature

The permissible ambient temperature range for vertical installation is as follows:

Operator Panels OP7, OP17 and OP27 Touch Panels TP27-6 and TP27-10 Text Display TD17 Multi Panel MP270 TFT	0 °C ≤ T_A ≤ 50 °C
Operator Panels OP15 and OP37 Multi Panel MP270 STN	0 °C ≤ T_A ≤ 45 °C
Touch Panel TP37	4 °C ≤ T_A ≤ 45 °C

Warning

The SIMATIC HMI devices must be mounted such that at least degree of protection IP 54 is guaranteed. Cancellation of the degree of protection during operation of the whole system — for maintenance purposes, for example — is not authorized.

The sealing flap for the floppy disk drive on the OP 37 may be opened only if no explosive atmosphere is present.

For maintenance work, you must also make sure that no explosive atmosphere is present.

Utilisation des pupitres SIMATIC HMI dans des environnements à atmosphère explosible

Environnement d'utilisation admissible

Les pupitres SIMATIC HMI OP7, OP15, OP17, OP27, OP37, TP27-6, TP27-10, TP37, TD17 et MP270 remplissent les exigences de construction de la EN 50021:1999 relative aux matériels électriques utilisés dans des environnements à atmosphère explosible de zone 2 ainsi que de la EN 50281-1-1:1998 relative aux matériels électriques utilisés dans des environnements à atmosphère explosible de zone 22.

Température ambiante admissible

Plage de température ambiante admissible en cas de pose verticale :

Pupitres opérateurs OP7, OP17, OP27 Pupitres tactiles TP27-6, TP27-10 Afficheur de texte TD17 Multi Panel MP270 TFT	0 °C ≤ T_A ≤ 50 °C
Pupitres opérateurs OP15, OP37 Multi Panel MP270 STN	0 °C ≤ T_A ≤ 45 °C
Pupitre tactile TP37	4 °C ≤ T_A ≤ 45 °C

Avertissement

Les pupitres SIMATIC HMI doivent être montés de sorte à garantir au moins l'indice de protection IP 54. Cet indice de protection ne doit pas être levé pendant le fonctionnement de l'installation, par exemple pour des travaux de maintenance.

Le couvercle du lecteur de disquettes de l'OP 37 ne doit être ouvert qu'en l'absence d'atmosphère explosive !

De même, les travaux de maintenance ne doivent être effectués qu'après s'être assuré de l'absence d'atmosphère explosive !

Impiego delle apparecchiature SIMATIC HMI in aree a rischio di esplosione

Campo di impiego ammesso

Le apparecchiature SIMATIC HMI OP7, OP15, OP17, OP27, OP37, TP27-6, TP27-10, TP37, TD17 e MP270 soddisfano le richieste delle caratteristiche costruttive EN 50021:1999 per dispositivi di servizio per l'impiego in aree a rischio di esplosione della zona 2, come anche EN 50281-1-1:1998 per dispositivi di servizio per l'impiego in aree a rischio di esplosione della zona 22.

Temperatura ambientale ammessa

Il campo termico ambientale ammesso con montaggio verticale è pari a:

Operator Panel OP7, OP17, OP27 Touch Panel TP27-6, TP27-10 Text Display TD17 Multi Panel MP270 TFT	0 °C ≤ T_A ≤ 50 °C
Operator Panel OP15, OP37 Multi Panel MP270 STN	0 °C ≤ T_A ≤ 45 °C
Touch Panel TP37	4 °C ≤ T_A ≤ 45 °C

Attenzione

Il montaggio delle apparecchiature SIMATIC HMI deve essere effettuato in modo da assicurare almeno la protezione IP 54. Una disattivazione della protezione durante il funzionamento dell'intero impianto, ad esempio per scopi di manutenzione, non è ammessa!

L'apertura del coperchio di chiusura per il floppy drive dell'OP 37 può avvenire solo se non è presente un'atmosfera esplosiva!

Anche per lavori di manutenzione ci si deve assicurare che non ci sia un'atmosfera esplosiva!

Aplicación de los equipos SIMATIC HMI en áreas con peligro de explosión

Ámbito de aplicación admisible

Los equipos SIMATIC HMI OP7, OP15, OP17, OP27, OP37, TP27-6, TP27-10, TP37, TD17 y MP270 cumplen las exigencias de tipo de construcción de la norma EN 50021:1999 para materiales eléctricos para su aplicación en áreas con peligro de explosión de la zona 2, así como de la norma EN 50281-1-1:1998 para materiales eléctricos para su aplicación en áreas con peligro de explosión de la zona 22.

Temperatura ambiente admisible

El margen de temperatura ambiente admisible en caso de montaje vertical es:

Paneles de operador OP7, OP17, OP27 Paneles táctiles TP27-6, TP27-10 Displays de texto TD17 Multi Panel MP270 TFT	0 °C ≤ T_A ≤ 50 °C
Paneles de operador OP15, OP37 Multi Panel MP270 STN	0 °C ≤ T_A ≤ 45 °C
Panel táctil TP37	4 °C ≤ T_A ≤ 45 °C

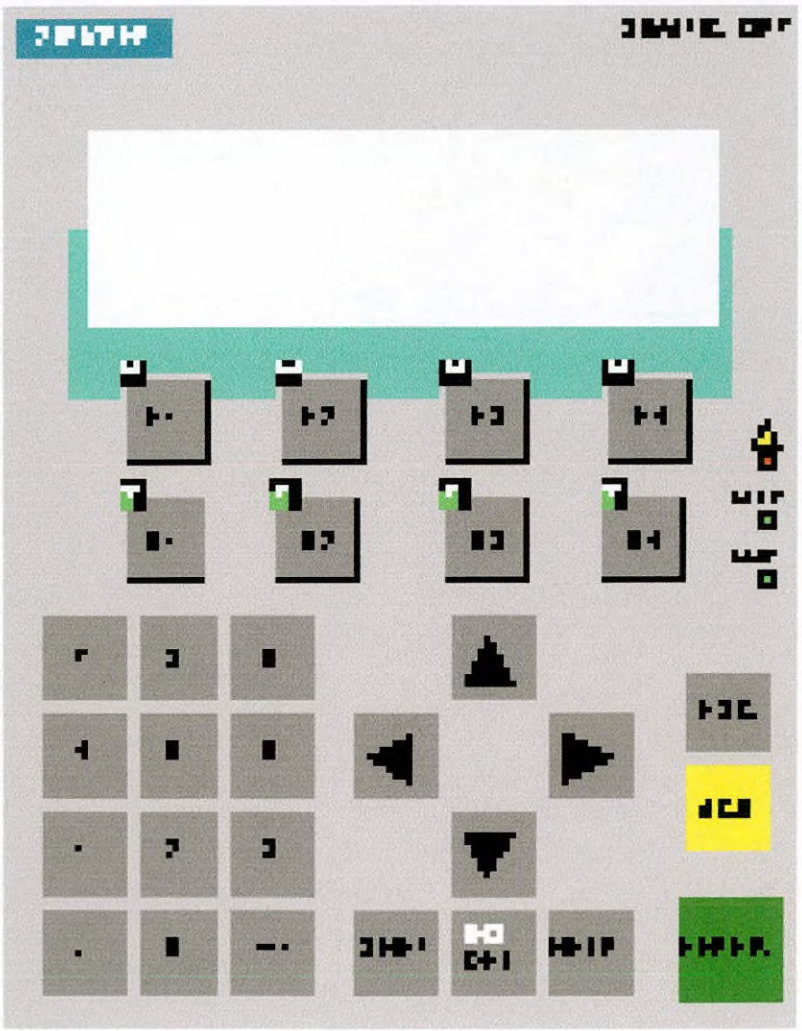
Advertencia

El montaje de los equipos SIMATIC HMI se ha de efectuar de modo tal que se garantice, como mínimo, el grado de protección IP 54. ¡No está permitida la supresión del grado de protección durante el funcionamiento de la instalación completa, p. ej. con fines de mantenimiento!

La apertura de la tapa de cierre para la disquetera en el OP 37 solamente se debe efectuar cuando no exista ninguna atmósfera apta para la producción de explosiones!

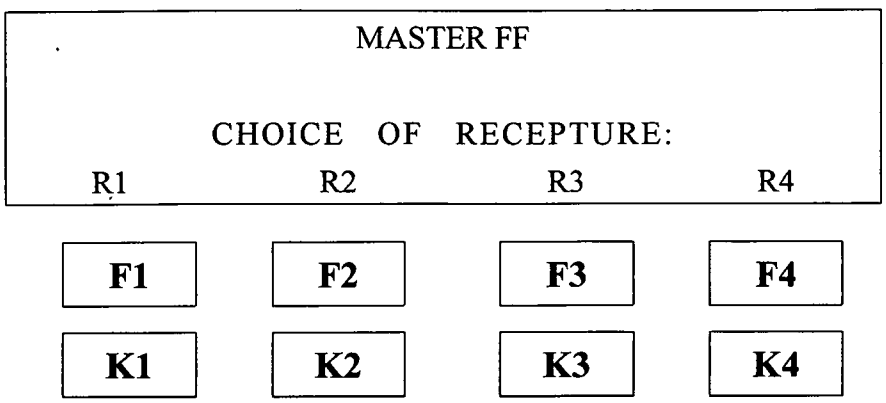
¡Para efectuar trabajos de mantenimiento se ha de asegurar igualmente que no exista ninguna atmósfera apta para la producción de explosiones!

Operating Instructions for
SIEMENS OP7 control panel
MASTER FF system



I. Main menu.

When the power is switched on the display shows auto test being carried out information. When the test is over „RESTART FINISHED" sign shows for about 1sek on the display main screen followed by the diagram:

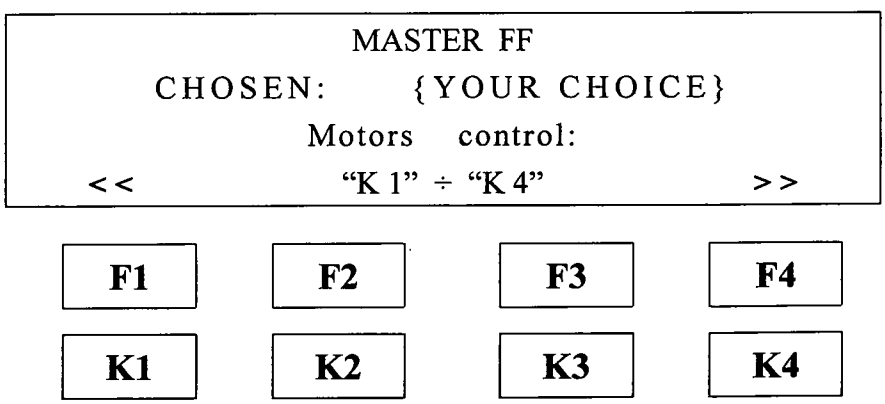


(1)

On the screen we can press F1 F2 F3 or F4 buttons in order to select one of four respective recipes R1, R2, R3 or R4. The recipe forms a set of the machine drive working parameters, which can be edited and stored in memory under one of four function buttons. (R1, R2, R3, R4).

II. Recipe Selection.

When the respective "F" button is pressed the following screen shows on the display:



(2)

Field {Your CHOICE}	Shows information about the number of the recipe selected
Field "<<"	Pressing F1 button transfers to the main screen
Field ">>"	Pressing F2 button transfers to the first recipe parameters "R..." editing screen
Starting K1 – K4 drives	Informs that K1 – K4 buttons are active for individual machine drive starting.

Start of K1 to K4 drives is signalled by the green LED diode being light underneath the respective button. The screen shows the following diagram:

INGREDIENDS:			
{INPUT} kg/g			
K 1	K 2	K 3	K 4
....%	....%	....%	....%

(3)

Field {INPUT} — Shows information about current fruit input consumption.

Field " ....% " — Shows information about current capacity expressed in "%" of the working drive.

With K1 to K4 buttons individual drives can be easily switched on or off at that screen.

Pressing F4 button and inserting required passwords one can transfer to servicing screens (see chapter VII) which enable to alter the control program functions.

In order to return to the previous screen use upper arrow key " △ "

III. Editing and storing the parameters.

A. Mix pump and worm conveyor parameters.

In order to transfer to the editing screens and data storing of the drive parameters press F4 function button at the recipe confirming screen (2) underneath the ">>" field. The following screens shows at this stage:

ICE CREAM PUMP			
Capacity		{capacity}%	
<<	-X%	+X%	>>

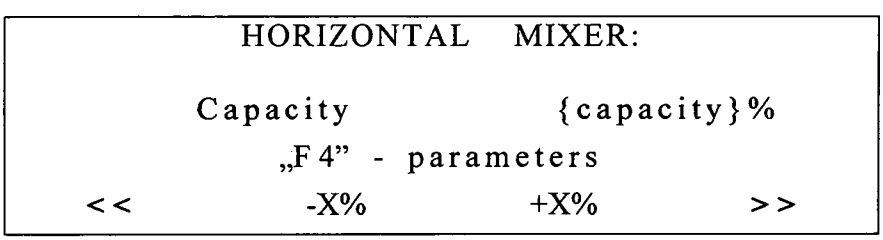
(4)

F1	F2	F3	F4
K1	K2	K3	K4

Field „ICE CREAM PUMP"	Gives information about the drive (engine) the parameters of which can be edited and stored.
Field {capacity}	Indicates the capacity of the mix pump value set expressed in "%". Possible values: min. – 20%, max. –100%
Fields „-X%", „+X%"	With the use of function keys F2 and F3 located underneath these fields the capacity can be adjusted by constant "X" value.
Field " < < "	Pressing F1 button located underneath this field causes return to the selected recipe information screen.
Field " > > "	Pressing F1 button located underneath this field causes transfer to the warm conveyor parameters editing screen.

The edition of individual drive capacity parameters can be performed by either the change of F2 F3 buttons value or (see the table above) or by inserting of the desired value with the numeric keys. In case of F2, F3 keys the change of capacity value is confirmed each time the above mentioned keys are pressed, on the contrary the insertion of the value from the numeric keyboard should be confirmed with "ENTER" button.

B. Horizontal stirrer parameters.



(5)

Field „HORIZONTAL MIXER"	Gives information about the drive (engine) the parameters of which can be edited and stored.
Field {capacity}	Indicates the capacity of the mix pump value set expressed in "%". Possible values: min. – 20%, max. –100%
Fields „-X%", „+X%"	With the use of function keys F2 and F3 located underneath these fields the capacity can be adjusted by constant "X" value.
Field " < < "	Pressing F1 button located underneath this field causes return to the worm conveyor parameters editing screen.
Filed " > > "	Pressing F1 button located underneath this field causes transfer to the horizontal stirrer working parameters editing screen.

Pressing F4 function button (see the table above) causes transfer to the horizontal stirrer parameters edition This brings down to setting the stirrer working mode.:

Continuous mode – the stirrer turns permanently in one direction. After selecting this mode the screen returns to the stirrer parameters editing main screen.

Impulse mode – the stirrer turns in both directions. After selecting this mode the screen transfers to the function where the turning time and interval time are set.

IV. Starting the machine.

After determining and inserting required parameters for individual recipes of work parameters, the machine can be started. Individual drives can be started from the screen (3) as well as all editing screens. The most convenient way to start the machine is in the chronological order.

ATTENTION!
The feeder drive can not be started if the mix pump has not been started beforehand. Switching off the mix pump drive causes automatically switch off of the worm conveyor drive.

V. Switching off the machine.

The machine switch off can be performed in two modes.

A. Regular – deals with switching off the individual drives with K1 to K4 buttons. The confirmation of this operation is when the green LED diode goes off.

B. Emergency – In this mode the machine is switched off when the emergency switch off button is pressed. All machine drives stop immediately. The control panel shows the information about the emergency Halt State.

VI. Emergency screens.

In case the machine drives are not functioning properly and are automatically stopped the reason of the automatic drive halt is displayed on the control panel in a form of a flashing message. The emergency state is also indicated by the red LED diode underneath the yellow warning triangle on the control panel.

In order to return to normal display mode confirm the emergency state message with ACK button. If the reason of the emergency state is not eliminated, pressing ACK button will switch off the message but will not cause the red emergency LED to go off.

Below is the table of the emergency messages and their possible reasons:

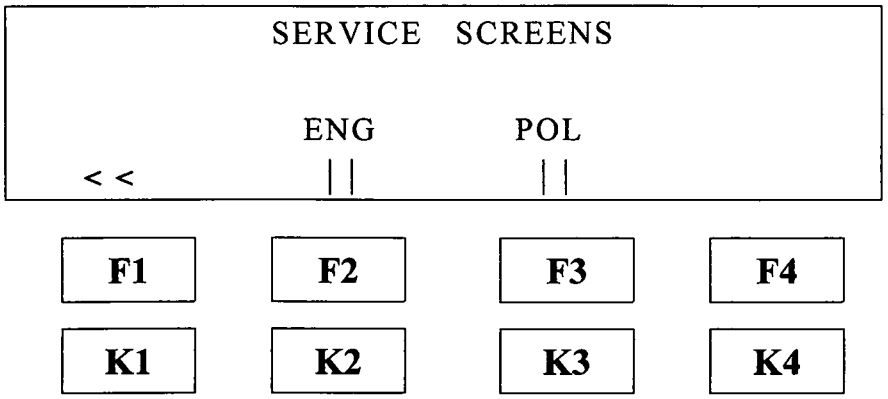
Emergency message	*Possible fault cause*
MIX PUMP FREQUENCY INVERYER FAULT	Mix pump frequency inverter fault.
WORM CONVEYOR FREQUENCY INVERTER FAULT	Worm conveyor frequency inverter fault
HORIZONTAL STIRRER FREQUENCY INVERTER FAULT	Horizontal stirrer frequency inverter fault.
VERTICAL STIRRER DRIVE THERMAL PROTECTION	Vertical stirrer drive overload electrical installation short circuit or overload.
OPEN CONTAINER OR TERMINAL SWITCH FAULET	The ingredients container lid not closed properly. Check the lid or terminal switch at the lid check the terminal switch cable.
EMERGENCY SWITCH PREESED IN	Machine has been stopped with the emergency switch.
DATA MEMORY POWER FAULT – REPLACE BATTERY	The machine has been disconnected from the power supply source for too long. The memory data battery is flat. Charge the battery or replace it with the new one.
ACTIVE BLOCADE CONTACT THE MANUFACTURER	Manufacturer determined limit of machine work has been exceeded. Contact the manufacturer for further instructions.

VII. Service functions.

By pressing "F4" the display (3) transfers to the service screens. The editing of the service screens is possible after inserting supervisor password **"6911"** with the numeric keyboard and confirming the password with "ENTER" key.

Service functions allow for:

- Change the display language
- "X" value editing – increase or decrease of the capacity.
- Storing data in the permanent memory
- Ingredients consumption indication editing



(6)

Field " < < "

Pressing the button F1 underneath this field returns to screen (3)

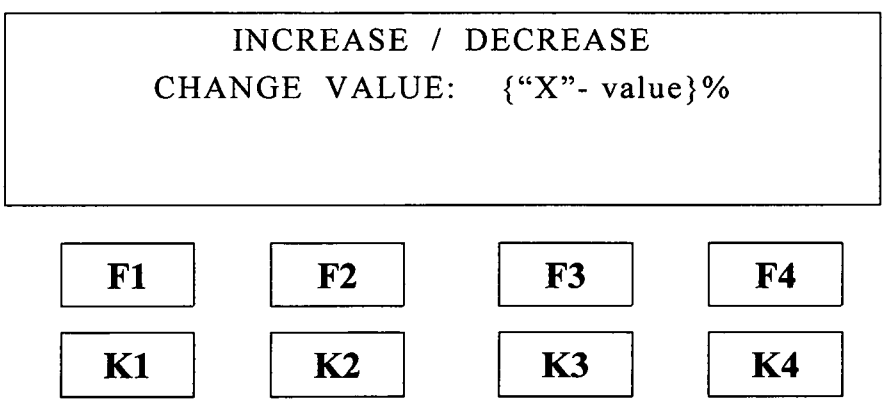
Button „F2"

Pressing the button F2 underneath the field ENG selects English language.

Button „F3"

Pressing F3 button underneath the field POL selects Polish language.

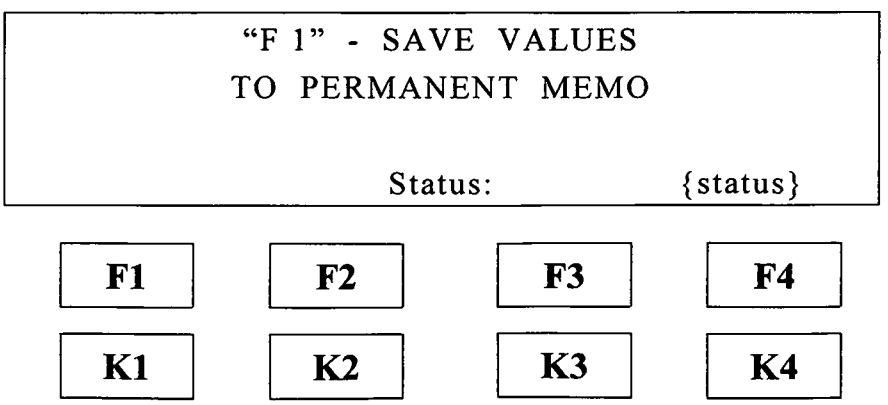
Switch between servicing screens with „ △ „ or „ ▽ „ cursors.



(7)

Pole {"X"- value}

Insert "X" value by which the machine drives capacity should be increased or decreased.



(8)

Field {status}

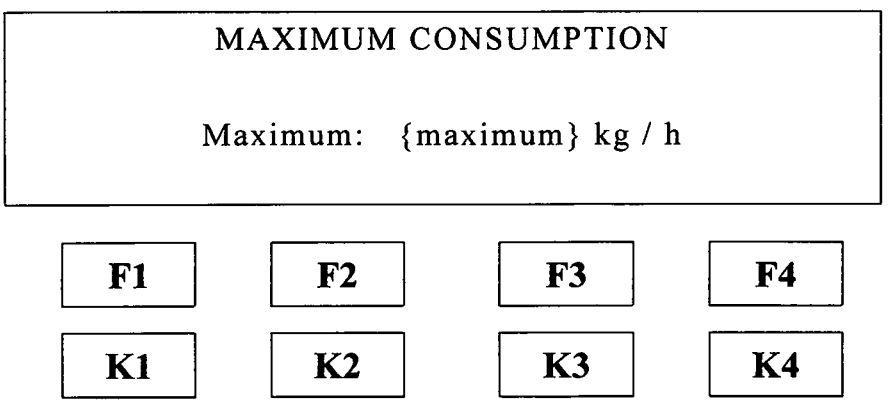
This field shows the current memory state:

„SAVE" - parameters ready for storing

„SAVED" - parameters already stored

Button „F1"

Pressing "F1" function button causes inserting the data to the controller permanent memory. This insertion is confirmed in the (status) field.



(9)

Field {maximum}

In this field insert maximum weight of the ingredients to be fed by the worm conveyor at the maximum capacity.

SYSDRIVE 3G3JV Series
3G3JV-A□ Compact Simplified Inverters
Safety Precautions
OMRON Corporation

 1615952-7A

Thank you for purchasing an OMRON SYSDRIVE Inverter. To ensure safe operation, please be sure to read the safety precautions provided in this document along with all of the user manuals for the SYSDRIVE Inverters and related Units. Please be sure you are using the most recent versions of the user manuals for your Units. Contact your nearest OMRON representative to obtain manuals. Keep these safety precautions and all user manuals in a safe location and be sure that they are readily available to the final user of the products.

■ Definition of Precautionary Information

⚠ DANGER Indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

⚠ WARNING Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

⚠ Caution Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury, or property damage.

■ Precautions

General Warnings

⚠ WARNING Do not touch the inside of the Inverter. Doing so may result in electrical shock.

⚠ WARNING Operation, maintenance, or inspection must be performed after turning OFF the power supply, confirming that the CHARGE indicator (or status indicators) are OFF, and after waiting for the time specified on the front cover. Not doing so may result in electrical shock.

⚠ WARNING Do not damage, pull on, apply stress to, place heavy objects on, or pinch the cables. Doing so may result in electrical shock.

⚠ WARNING Do not touch the rotating parts of the motor under operation. Doing so may result in injury.

⚠ WARNING Do not modify the product. Doing so may result in injury or damage to the product.

⚠ Caution Do not store, install, or operate the product in the following places. Doing so may result in electrical shock, fire or damage to the product.

- Locations subject to direct sunlight.
- Locations subject to temperatures or humidity outside the range specified in the specifications.
- Locations subject to condensation as the result of severe changes in temperature.
- Locations subject to corrosive or flammable gases.
- Locations subject to exposure to combustibles.
- Locations subject to dust (especially iron dust) or salts.
- Locations subject to exposure to water, oil, or chemicals.
- Locations subject to shock or vibration.

⚠ Caution Do not touch the Inverter radiator, regenerative resistor, or Servomotor while the power is being supplied or soon after the power is turned OFF. Doing so may result in a skin burn due to the hot surface.

⚠ Caution Do not conduct a dielectric strength test on any part of the Inverter. Doing so may result in damage to the product or malfunction.

⚠ Caution Take appropriate and sufficient countermeasures when installing systems in the following locations. Not doing so may result in equipment damage.

- Locations subject to static electricity or other forms of noise.
- Locations subject to strong electromagnetic fields and magnetic fields.
- Locations subject to possible exposure to radioactivity.
- Locations close to power supplies.

Transportation Precautions

⚠ Caution Do not hold by front cover or panel , instead, hold by the radiation fin (heat sink) while transporting the product. Doing so may result in injury.

⚠ Caution Do not pull on the cables. Doing so may result in damage to the product or malfunction.

⚠ Caution Use the eye-bolts only for transporting the Inverter. Using them for transporting the machinery may result in injury or malfunction.

Installation Precautions

⚠ WARNING Provide an appropriate stopping device on the machine side to secure safety. (A holding brake is not a stopping device for securing safety.) Not doing so may result in injury.

⚠ WARNING Provide an external emergency stopping device that allows an instantaneous stop of operation and power interruption. Not doing so may result in injury.

⚠ Caution Be sure to install the product in the correct direction and provide specified clearances between the Inverter and control panel or with other devices. Not doing so may result in fire or malfunction.

⚠ Caution Do not allow foreign objects to enter inside the product. Doing so may result in fire or malfunction.

⚠ Caution Do not apply any strong impact. Doing so may result in damage to the product or malfunction.

Wiring

⚠ WARNING Wiring must be performed only after confirming that the power supply has been turned OFF. Not doing so may result in electrical shock.

⚠ WARNING Wiring must be performed by authorized personnel. Not doing so may result in electrical shock or fire.

⚠ WARNING Be sure to confirm operation only after wiring the emergency stop circuit. Not doing so may result in injury.

⚠ WARNING Always connect the ground terminals to a ground of 100 Ω or less for the 200-V AC class, or 10 Ω or less for the 400-V AC class. Not connecting to a proper ground may result in electrical shock.

⚠ Caution Install external breakers and take other safety measures against short-circuiting in external wiring. Not doing so may result in fire.

⚠ Caution	Confirm that the rated input voltage of the Inverter is the same as the AC power supply voltage. An incorrect power supply may result in fire, injury, or malfunction.
⚠ Caution	Connect the Braking Resistor and Braking Resistor Unit as specified in the manual. Not doing so may result in fire.
⚠ Caution	Be sure to wire correctly and securely. Not doing so may result in injury or damage to the product.
⚠ Caution	Be sure to firmly tighten the screws on the terminal block. Not doing so may result in fire, injury, or damage to the product.
⚠ Caution	Do not connect an AC power to the U, V, or W output. Doing so may result in damage to the product or malfunction.

Operation and Adjustment Precautions

⚠ WARNING	Turn ON the input power supply only after mounting the front cover, terminal covers, bottom cover, Operator, and optional items. Not doing so may result in electrical shock.
⚠ WARNING	Do not remove the front cover, terminal covers, bottom cover, Operator, or optional items while the power is being supplied. Not doing so may result in electrical shock or damage to the product.
⚠ WARNING	Do not operate the Operator or switches with wet hands. Doing so may result in electrical shock.
⚠ WARNING	Do not touch the inside of the Inverter. Doing so may result in electrical shock.
⚠ WARNING	Do not come close to the machine when using the error retry function because the machine may abruptly start when stopped by an alarm. Doing so may result in injury.
⚠ WARNING	Do not come close to the machine immediately after resetting momentary power interruption to avoid an unexpected restart (if operation is set to be continued in the processing selection function after momentary power interruption is reset). Doing so may result in injury.
⚠ WARNING	Provide a separate emergency stop switch because the STOP Key on the Operator is valid only when function settings are performed. Not doing so may result in injury.
⚠ WARNING	Be sure confirm that the RUN signal is turned OFF before turning ON the power supply, resetting the alarm, or switching the LOCAL/REMOTE selector. Doing so while the RUN signal is turned ON may result in injury.
⚠ Caution	Be sure to confirm permissible ranges of motors and machines before operation because the Inverter speed can be easily changed from low to high. Not doing so may result in damage to the product.
⚠ Caution	Provide a separate holding brake when necessary. Not doing so may result in injury.
⚠ Caution	Do not perform a signal check during operation. Doing so may result in injury or damage to the product.
⚠ Caution	Do not carelessly change settings. Doing so may result in injury or damage to the product.

Maintenance and Inspection Precautions

⚠ WARNING	Do not touch the Inverter terminals while the power is being supplied.
⚠ WARNING	Maintenance or inspection must be performed only after turning OFF the power supply, confirming that the CHARGE indicator (or status indicators) is turned OFF, and after waiting for the time specified on the front cover. Not doing so may result in electrical shock.
⚠ WARNING	Maintenance, inspection, or parts replacement must be performed by authorized personnel. Not doing so may result in electrical shock or injury.
⚠ WARNING	Do not attempt to take the Unit apart or repair. Doing either of these may result in electrical shock or injury.
⚠ Caution	Carefully handle the Inverter because it uses semiconductor elements. Careless handling may result in malfunction.
⚠ Caution	Do not change wiring, disconnect connectors, the Operator, or optional items, or replace fans while power is being supplied. Doing so may result in injury, damage to the product, or malfunction.

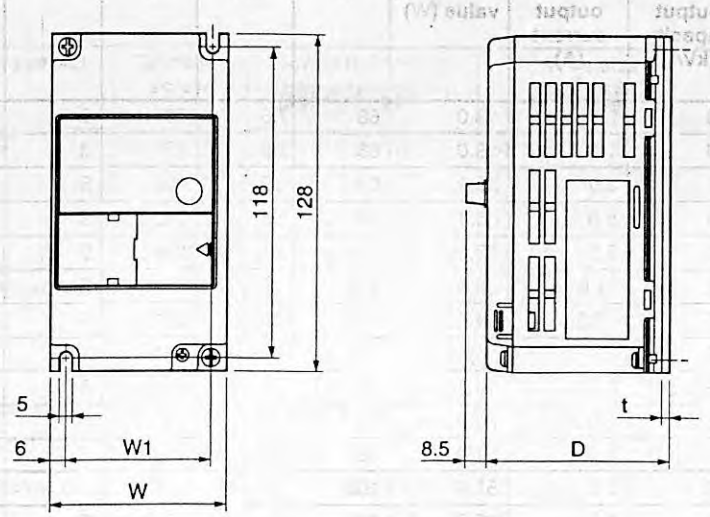
■ Warnings for UL/cUL Marking

- Do not connect or disconnect wiring, or perform signal checks while the power supply is turned ON.
- The Inverter internal capacitor is still charged even after the power supply is turned OFF. To prevent electrical shock, disconnect all power before servicing the Inverter. Then wait at least one minute after the power supply is disconnected and all indicators are OFF.
- Do not perform a withstand voltage test on any part of the Inverter. This electronic equipment uses semiconductors and is vulnerable to high voltage.
- Do not remove the Digital Operator or the blank cover unless the power supply is turned OFF. Never touch the printed control board (PCB) while the power supply is turned ON.
- The Inverter is not suitable for use on a circuit capable of delivering more than 5,000 RMS symmetrical amperes, 250 volts maximum (200-V-class Units) or 18,000 RMS symmetrical amperes, 480 V maximum (400-V-class Units).

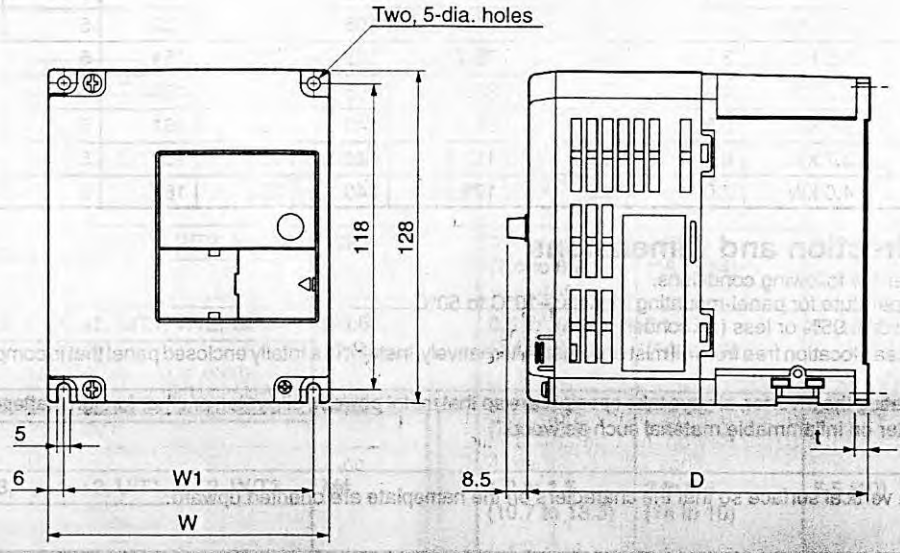
CAUTION
Separate motor overcurrent, overload and overheating protection is required to be provided in accordance with CANADIAN ELECTRICAL CODE, PART I and NEC. Use 75°C copper wires or equivalent. Low voltage wires shall be wired with Class I Wiring.
ATTENTION
Une protection distincte contre les surintensités, la surcharge et la surchauffé de moteur doit être fournie conformément AU CODE CANADIEN DE L'ELECTRICITE, PREMIER PARTIE et LE NATIONAL DE L'ELECTRICITE.

■ Dimensions

1



2



Rated voltage	Model 3G3JV-	Maximum applicable motor capacity	Rated output capacity (kVA)	Rated output current (A)	Calorific value (W)	W	W1	D	t	Dimensions drawing number	Weight (kg)
3-phase 200 V AC	A2001	0.1 kW	0.3	0.8	13.0	68	56	70	3	1	Approx. 0.5
	A2002	0.2 kW	0.6	1.6	18.0	68	56	70	3	1	Approx. 0.5
	A2004	0.4 kW	1.1	3.0	28.1	68	56	102	5	1	Approx. 0.8
	A2007	0.75 kW	1.9	5.0	45.1	68	56	122	5	1	Approx. 0.9
	A2015	1.5 kW	3.0	8.0	72.8	108	96	129	5	2	Approx. 1.3
	A2022	2.2 kW	4.2	11.0	94.8	108	96	154	5	2	Approx. 1.5
	A2037	3.7 kW	6.7	17.5	149.1	140	128	161	5	2	Approx. 2.1
	A2040	4.0 kW	6.7	17.5	149.1	140	128	161	5	2	Approx. 2.1
Single-phase 200 V AC	AB001	0.1 kW	0.3	0.8	14.1	68	56	70	3	1	Approx. 0.5
	AB002	0.2 kW	0.6	1.6	20.0	68	56	70	3	1	Approx. 0.5
	AB004	0.4 kW	1.1	3.0	31.9	68	56	112	5	1	Approx. 0.9
	AB007	0.75 kW	1.9	5.0	51.4	108	96	129	5	2	Approx. 1.5
	AB015	1.5 kW	3.0	8.0	82.8	108	96	154	5	2	Approx. 1.5
3-phase 200 V AC	A4002	0.2 kW	0.9	1.2	23.1	108	96	81	5	2	Approx. 1.0
	A4004	0.4 kW	1.4	1.8	30.1	108	96	99	5	2	Approx. 1.1
	A4007	0.75 kW	2.6	3.4	54.9	108	96	129	5	2	Approx. 1.5
	A4015	1.5 kW	3.7	4.8	75.7	108	96	154	5	2	Approx. 1.5
	A4022	2.2 kW	4.2	5.5	83.0	108	96	154	5	2	Approx. 1.5
	A4030	3.0 kW	5.5	7.2	95.8	140	128	161	5	2	Approx. 2.1
	A4037	3.7 kW	6.6	8.6	117.9	140	128	161	5	2	Approx. 2.1
	A4040	4.0 kW	7.0	9.2	129.1	140	128	161	5	2	Approx. 2.1

■ Installation Direction and Dimensions

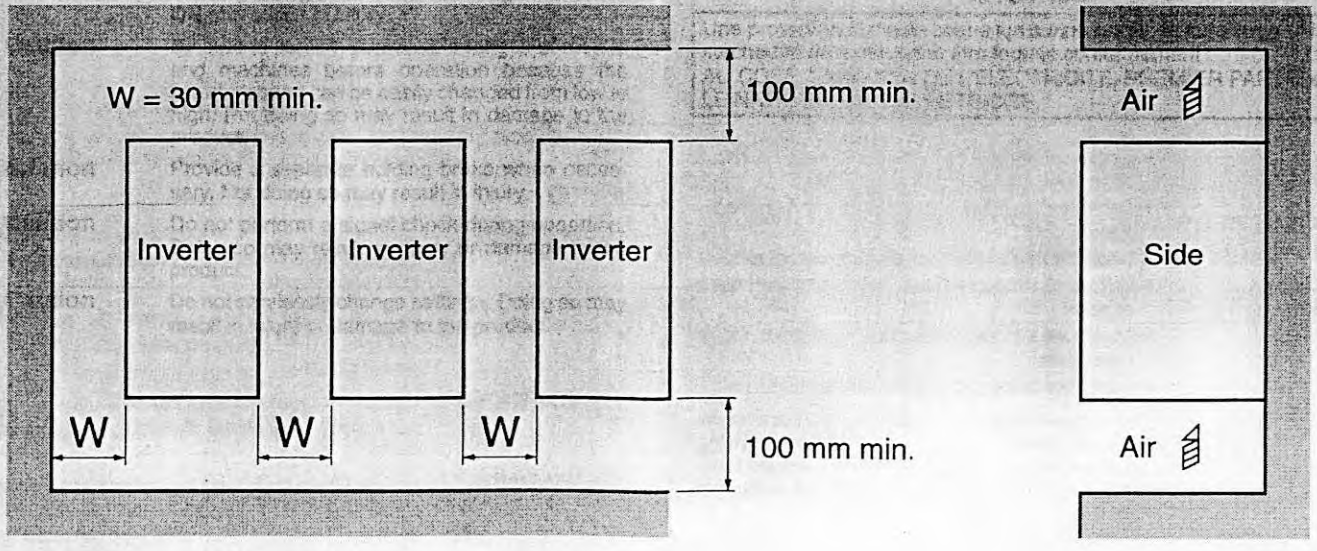
- Install the Inverter under the following conditions.
  Ambient operating temperature for panel-mounting models: –10°C to 50°C
  Ambient operating humidity: 95% or less (no condensation)
- Install the Inverter in a clean location free from oil mist and dust. Alternatively, install it in a totally enclosed panel that is completely protected from floating dust.
- When installing or operating the Inverter, always take special care so that metal powder, oil, water, or other foreign matter does not get into the Inverter.
- Do not install the Inverter on inflammable material such as wood.

■ Direction

- Install the Inverter on a vertical surface so that the characters on the nameplate are oriented upward.

■ Dimensions

- When installing the Inverter, always provide the following clearances to allow normal heat dissipation from the Inverter.



■ Wiring

Control Circuit

Model 3G3JV-□	Terminal symbol	Terminal screw	Screw tightening torque N·m (lb·in)	Wire size mm² (AWG)	Recommended wire size mm² (AWG)	Type of wire
Common to all models	MA, MB, MC	M3	0.5 to 0.6 (4.4 to 5.3)	Stranded wire: 0.5 to 1.25 (20 to 16) Single wire: 0.5 to 1.25 (20 to 16)	0.75 (18)	Shielded wire, etc.
	S1 to S5, SC, FS, FR, FC, AM, AC	M2	0.22 to 0.25 (2 to 2.2)	Stranded wire: 0.5 to 0.75 (20 to 18) Single wire: 0.5 to 1.25 (20 to 16)	0.75 (18)	

Main Circuit (Power cables: 600-V vinyl cables, etc.)

- 3-phase 200-V AC Model

Model 3G3JV-	Terminal symbol	Terminal screw	Screw tightening torque N•m (lb•in)	Wire size mm² (AWG)	Recommended wire size mm² (AWG)	Molded-case circuit breaker capacity (A)
A2001	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3 ⏚	M3.5	0.8 to 1.0 (7.1 to 8.9)	0.75 to 2 (18 to 14)	2 (14)	5
A2002	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3 ⏚	M3.5	0.8 to 1.0 (7.1 to 8.9)	0.75 to 2 (18 to 14)	2 (14)	5
A2004	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3 ⏚	M3.5	0.8 to 1.0 (7.1 to 8.9)	0.75 to 2 (18 to 14)	2 (14)	5
A2007	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3 ⏚	M3.5	0.8 to 1.0 (7.1 to 8.9)	0.75 to 2 (18 to 14)	2 (14)	10
A2015	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3 ⏚	M3.5	0.8 to 1.0 (7.1 to 8.9)	2 to 5.5 (14 to 10)	2 (14)	20
A2022	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3 ⏚	M3.5	0.8 to 1.0 (7.1 to 8.9)	2 to 5.5 (14 to 10)	3.5 (12)	20
A2037 A2040	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3 ⏚	M4	1.2 to 1.5 (10.7 to 13.3)	2 to 5.5 (14 to 10)	5.5 (10)	30

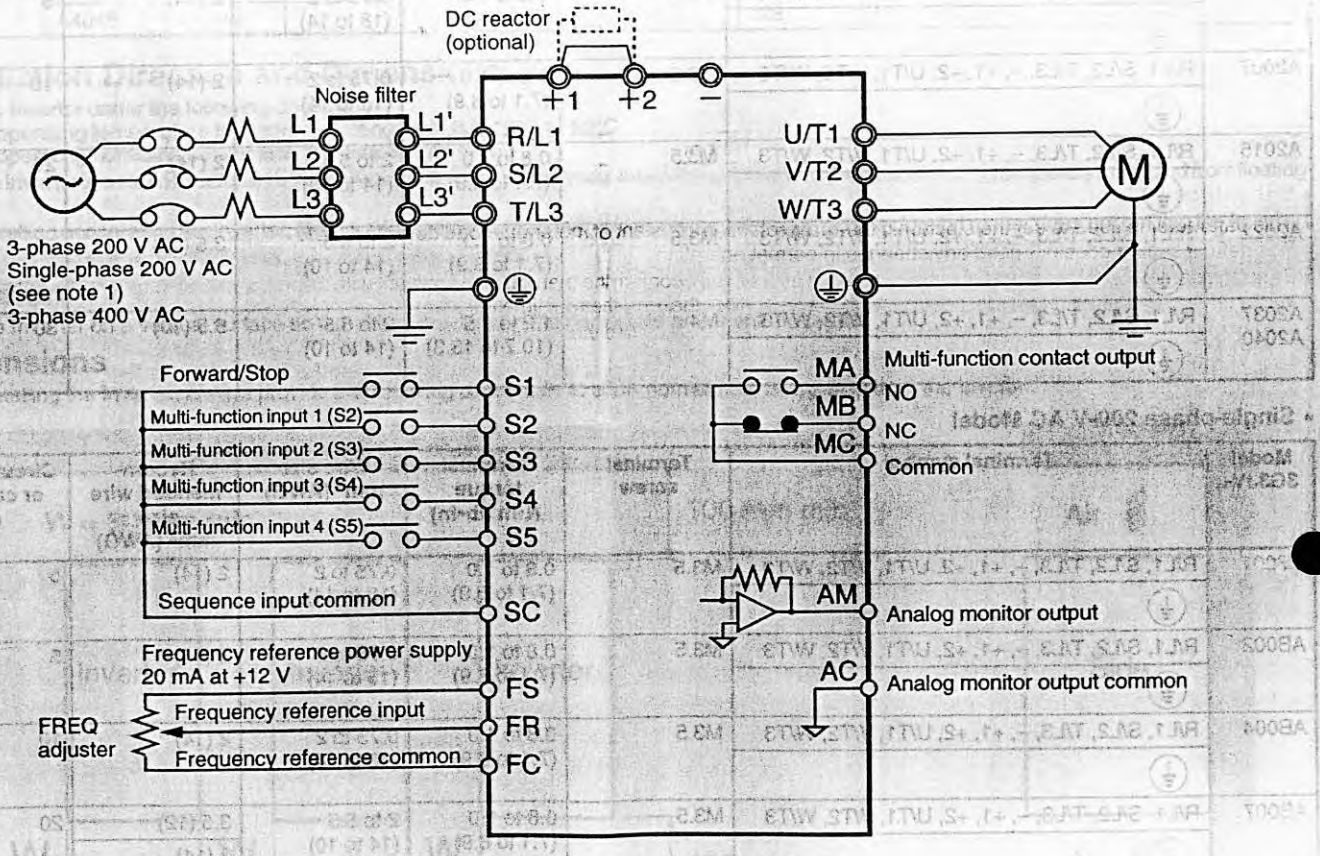
- Single-phase 200-V AC Model

Model 3G3JV-	Terminal symbol	Terminal screw	Terminal torque N•m (lb•in)	Wire size mm² (AWG)	Recommended wire size mm² (AWG)	Circuit breaker capacity (A)
AB001	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3 ⏚	M3.5	0.8 to 1.0 (7.1 to 8.9)	0.75 to 2 (18 to 14)	2 (14)	5
AB002	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3 ⏚	M3.5	0.8 to 1.0 (7.1 to 8.9)	0.75 to 2 (18 to 14)	2 (14)	5
AB004	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3 ⏚	M3.5	0.8 to 1.0 (7.1 to 8.9)	0.75 to 2 (18 to 14)	2 (14)	10
AB007	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3 ⏚	M3.5	0.8 to 1.0 (7.1 to 8.9)	2 to 5.5 (14 to 10)	3.5 (12) 2 (14)	20
AB015	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3 ⏚	M3.5	0.8 to 1.0 (7.1 to 8.9)	2 to 5.5 (14 to 10)	5.5 (10) 2 (14)	20

• 3-phase 400-V AC Model

Model 3G3JV-	Terminal symbol	Terminal screw	Screw tightening torque N•m (lb•in)	Wire size mm² (AWG)	Recommended wire size mm² (AWG)	Molded-case circuit breaker capacity (A)
A4002	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3	M3.5	0.8 to 1.0 (7.1 to 8.9)	2 to 5.5 (14 to 10)	2 (14)	5
	⏚					
A4004	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3	M3.5	0.8 to 1.0 (7.1 to 8.9)	2 to 5.5 (14 to 10)	2 (14)	5
	⏚					
A4007	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3	M3.5	0.8 to 1.0 (7.1 to 8.9)	2 to 5.5 (14 to 10)	2 (14)	5
	⏚					
A4015	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3	M3.5	0.8 to 1.0 (7.1 to 8.9)	2 to 5.5 (14 to 10)	2 (14)	10
	⏚					
A4022	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3	M4	1.2 to 1.5 (10.7 to 13.3)	2 to 5.5 (14 to 10)	2 (14)	10
	⏚					
A4030	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3	M4	1.2 to 1.5 (10.7 to 13.3)	2 to 5.5 (14 to 10)	2 (14)	20
	⏚					
A4037 A4040	R/L1, S/L2, T/L3, –, +1, +2, U/T1, V/T2, W/T3	M4	1.2 to 1.5 (10.7 to 13.3)	2 to 5.5 (14 to 10)	3.5 (12)	20
	⏚					

■ Standard Connections



Note 1. Connect single-phase 200 V AC to terminals R/L1 and S/L2 of the 3G3JV-AB□.
2. The braking resistor cannot be connected because no braking transistor is incorporated.

■ Motor Protection Settings

Rated Motor Current (n32)

- Set the rated motor current (n32) in order to prevent the motor from burning due to overloading.
- Check the rated current on the motor nameplate and set the parameter.
- This parameter is used for the electronic thermal function for motor overload detection (OL1). By setting the correct parameter, the overloaded motor will be protected from burning.

n32	Rated Motor Current			Changes during operation	No
Setting range	0.0% to 120% (A) of rated output current of Inverter	Unit of setting	0.1 A	Default setting	(see note 1)

Note 1. The standard rated current of the maximum applicable motor is the default rated motor current.
2. Motor overload detection (OL1) is disabled by setting the parameter to 0.0.

Motor Protection Characteristics (n33 and n34)

- This parameter setting is for motor overload detection (OL1).

n33	Motor Protection Characteristic Selection			Changes during operation	No
Setting range	0 to 2	Unit of setting	1	Default setting	0

- **Set Values**

Value	Description
0	Protection characteristics for general-purpose induction motors
1	Protection characteristics for Inverter-dedicated motors
2	No protection

- This parameter is used to set the electric thermal characteristics of the motor to be connected.
- Set the parameter according to the motor.
- If a single Inverter is connected to more than one motor, set the parameter to 2 for no protection. The parameter is also disabled by setting n32 for rated motor current to 0.0. Provide thermal relays or other methods separately for each motor to protect equipment from overloads.

n34	Motor Protection Time			Changes during operation	No
Setting range	1 to 60 (min)	Unit of setting	1 min	Default setting	8

- **Set Values**
- This parameter is used to set the electronic thermal protection constant of motor overload detection OL1.
- The default setting does not need any changes in normal operation.
- To set the parameter according to the characteristics of the motor, confirm the thermal time constant with the motor manufacturer and set the parameter with some margin. In other words, set the value a little shorter than the thermal time constant.
- To detect motor overloading more quickly, reduce the set value, provided that it does not cause any application problems.

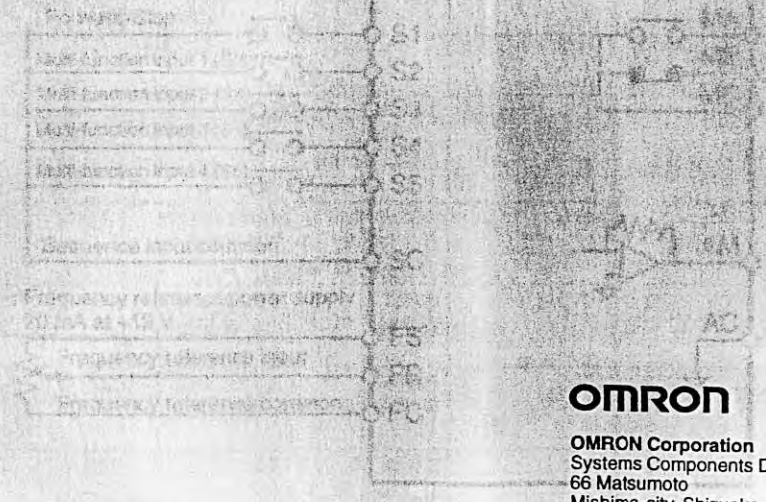
■ Reference Manuals

Name	Cat No.
SYSDRIVE 3G3JV Simplified Compact Inverters User's Manual	I528

■ Application Precautions

You must allow sufficient leeway in ratings and performance and provide proper fail-safe and other safety measures when using the Inverter in any of the following applications. Be sure also to consult with you OMRON representative before actually attempting any of these applications.

1. Applications under conditions or environments not specified in user manuals.
2. Applications for nuclear control systems, railroad systems, aviation systems, vehicles, combustion systems, medical equipment, amusement machines, and safety equipment.
3. Applications for other systems, machines, and equipment that may have a serious influence on lives and property if used improperly.



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Note: Specifications subject to change without notice.
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