

DEAR BUYER,

Depending on their layouts, buffer tanks can be operated from several different energy sources: indirectly from solar energy, or gas-based, coal-based or other based energy carriers (i.e. auxiliary electric heating). Paying attention to these usage instructions, you are kindly asked to turn to a professional technician to perform the connection of the appliance in the heating circuit and to put into operation the appliance for the first time. Please read these installation and operation instructions carefully and follow the instructions precisely. In this manner, you can ensure that your unit will operate in a reliable way during a long time.

STRUCTURE AND OPERATION

The buffer tanks are composed of a steel tank, foamed polystyrene insulation, PS sheath and a cover. The tank and the heating pipe coil are made of St37-2 steel.

As the internal surface of buffer tanks contain no corrosion protection, they can only be filled up with heating water. They are not adequate for storing drinking water!

The insulation of the tanks is polystyrene (with graphite) foam of thickness of max. 110 mm; and their sheath is made of plastic. Both the sheath and the insulation are mountable (over 500 liter capacity), so the tank can be fixed into its operation position through their removal (as well). Without its insulation,

the largest tank can be carried through the door of size 800 mm. Combined buffer tanks (PT_CF) provide sanitary hot water in an instantaneous way, heating cold water through the wall of the flexible pipe of stainless steel. However, a simple buffer tank system (PT) combined with an indirect tank is also able to produce hot water, either directly from the heat production unit or from energy gained from the buffer tank. The foamed polystyrene surrounding the internal tank keeps the water at given temperature for a long time, without any energy intake.

Type selection:

Buffer tanks are sold in standing forms, with volumes of 300, 500, 750 and 1000 litres, in "empty" (PT) , "pipe coil" (PT_C) and "combined" (PT_CF) layouts. "Empty" buffer tanks (PT types) contain 9 pipe branches for connection of heat producing units and heat expenditure units and they contain 1/2" sensor pipe branches. Buffer tanks with pipe coil (PT_C types) contain a heat exchanger for direct connection of solar systems or systems with heat pump. In addition to features described above, combined tanks (PT...CF types) contain a flexible pipe of stainless steel to produce sanitary hot water. The most important external and connection sizes of the appliances are described in Table 1 and in Figures 1 and 2 below.

Operation target

Buffer tanks work as energy storages for heating systems. They balance timely discrepancies between heat production (or available energy) and heat need, thus ensuring conveniences.

Technical data

Technical feature	Type	PT																				
		300	500	750	1000	300C	500C	750C	1000C	500CF	750CF	1000CF										
Nominal volume	(liter)	300	500	750	1070	300	500	750	1000	300	500	750	1000	500	750	1000						
Diameter (without Insulation)	(mm)	-	Ø650	Ø790	Ø790	-	Ø650	Ø790	Ø790	Ø650	Ø790	Ø790	Ø790	Ø650	Ø790	Ø790						
Diameter (with insulation)	(mm)	Ø660	Ø870	Ø1010	Ø1010	Ø660	Ø870	Ø1010	Ø1010	Ø660	Ø870	Ø1010	Ø1010	Ø870	Ø1010	Ø1010						
Height	(mm)	1535	1890	1920	2320	1535	1890	1920	2320	1535	1890	1920	2320	1890	1920	2320						
Max. operating pressure:																						
- tank	(bar)	6	5	5	5	6	5	5	5	5	5	5	5	5	5	5						
- solar pipe coil	(bar)	— 6																				
- sanitary hot water pipe	(bar)	— 10																				
Water pipeline connection		Rp6/4"																				
Electric heating cartridge connect.		Rp6/4"																				
Sensor connections		Rp1/2"																				
Sanitary hot water connections		— G1"																				
Pipe coil surface	(m ²)	—			1,5			2,2			2,8			2,2			2,8			2,8		
Sanitary hot water pipe coil surface	(m ²)	— 6,8																				

Table 1

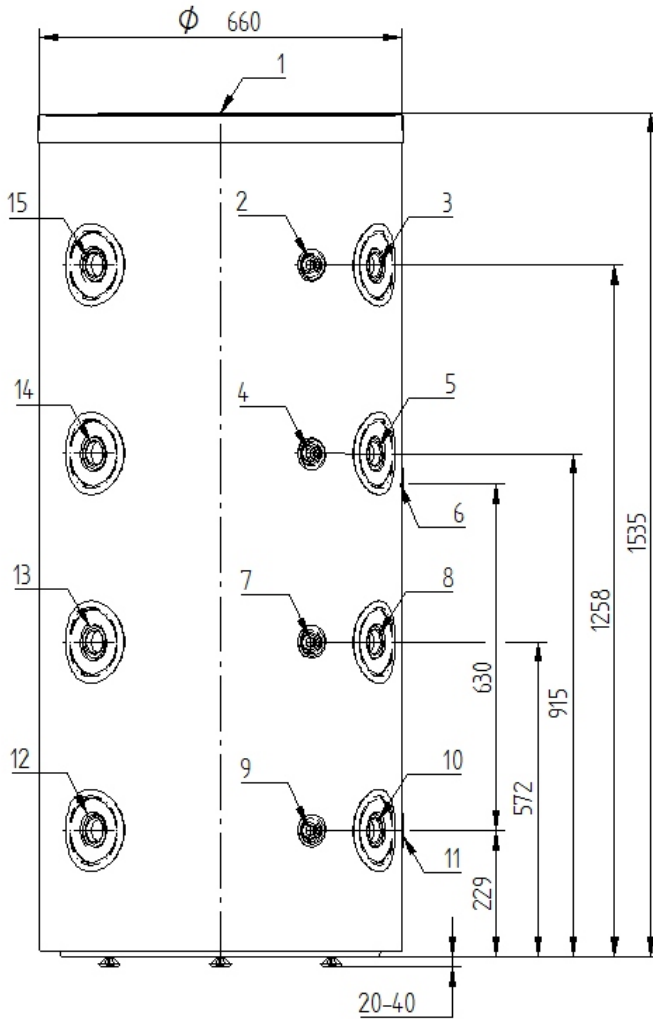


Figure 1
Sizes and connections of PT300 and PT300C buffer tanks

1. upper pipe branch Rp6/4", **2.,4.,7.,9.** heat sensor pipe branch Rp1/2", **3.,5.,8.,10.** heat production/heat expenditure pipe branch Rp6/4", **6.,11.** heat exchange pipe branch Rp3/4", **12.,13.,15.** heat production/heat expenditure pipe branch Rp6/4", **14.** auxiliary electric heating pipe branch Rp6/4" Pipe branch stand off is 100 mm, heat exchange pipe branch stand off is 120 mm.

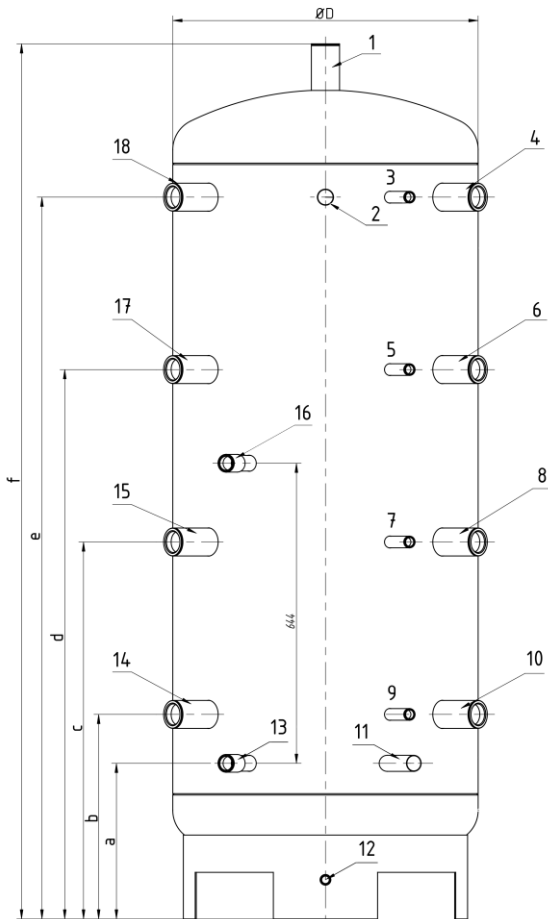


Figure 2

Sizes and connections of PT500,-750,-1000; PT500C,-750C,-1000C and PT500CF,-750CF,1000CF buffer tanks

Vol.	a	b	c	d	e	F	ØD
500 l	335	440	810	1180	1450	1890	650
750 l	350	450	820	1190	1560	1920	790
1000 l	350	450	920	1390	1860	2320	790

1. upper pipe branch Rp6/4", **3.,5.,7.,9.** heat sensor pipe branch Rp1/2", **4.,6.,8.,10.** heat production/heat expenditure pipe branch Rp6/4", **13.,16.** heat exchange pipe branch Rp1", **2.,11.** sanitary hot water heat exchange pipe branch G1", **14.,15.,18.** heat production/ heat expenditure pipe branch Rp6/4", **12.** drainage pipe branch G1/2", **17.** auxiliary electric heating pipe branch Rp6/4" Pipe branch stand off is 110 mm, stand off of sanitary hot water heat exchange pipe branch is 120 mm.

DEPLOYMENT

In order to deploy buffer tanks, the following conditions should be ensured:

- Ensure intact and stable flooring, so that it can keep the total weight of the buffer tank filled up with water.
- Horizontal flat flooring, to guarantee absolutely vertical standing of the unit. Vertical standing should be performed with adequately secure support of the legs.
- The buffer should be deployed only in a location protected against frost. In case of frost danger, the buffer tank should be emptied.
- The unit should be installed in a way that its distance from the wall is at least 50 mm.
- Due to any possible system expansion, a distance of at least 70 cm should be guaranteed between 6/4" pipe branches and the and the wall or other structural building element.
- Adequate pipeline and waste water collection systems (floor drains) should be ensured on the location of the installation or adequate electric system, in case of auxiliary electric heating.
- In order to keep heat loss at minimum, it is highly recommended that you install the buffer tank as close to heat consuming units as possible. It is

also reasonable to provide insulation for the water pipes.

- Unused connection pipe branches of the buffer tank should be closed and it is proposed to provide heat insulation for them.
- Mount a drain tap on the drainage pipe branch of the tank.

IT IS AT THE RISK OF DEATH AND THEREFORE IT IS FORBIDDEN TO PUT THE WATER TANK AND THE HEAT EXCHANGERS UNDER A PERMITTED LARGER THAN THE PERMITTED OPERATION PRESSURE. THESE VALUES ARE DESCRIBED IN TABLE 1.

It is obligatory to build in the security valve, but this lies outside the scope of shipment of the appliance.

IT IS FORBIDDEN TO MOUNT WATER PIPELINE FITTINGS BETWEEN THE SECURITY VALVE AND THE BUFFER TANK.

Before mounting the valve, water pipelines have to be flushed thoroughly, in order to avoid any damage caused by any possible pollution.

Recommended heating connection -1

- 2 DHW
 - 3 Drinking water expansion tank
 - 4 Thermostatic mixer valve
 - 5 Indirect storage tank
 - 6 Thermal protection switch
 - 7 Surface heating
 - 8 radiator
 - 9 0,2 litre air accumulator and manual solar air vent
 - 10 VTN or VTS vacuum tube collectors
 - 11 Solar expansion tank
 - 12 Spill container
 - 13 Sealed expansion tank
 - 14 Heating buffer
 - 15 Thermostatic boiler protection mixer valve
 - 16 Heating circulation pump
 - 18 Thermal safety valve connected to safety water chamber
 - 19 Solid fuel boiler
 - 20 Safety vent valve
- 1, 17 Connection to domestic water supply

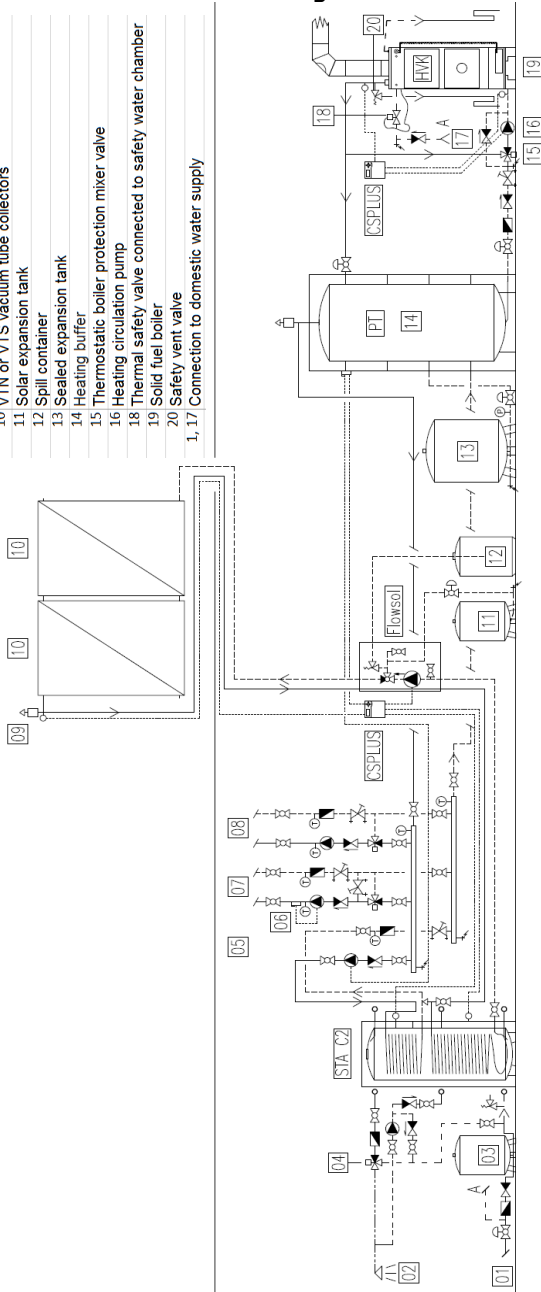


Figure 3

Recommended heating connection 2

- | | |
|--------|---|
| 1 | Heating flow - return |
| 2 | DHW |
| 5 | Thermostatic mixer valve |
| 6 | Drinking water expansion tank |
| 7 | Drinking water circulation pump |
| 9 | Heating expansion tank |
| 10 | Heating flow - forward |
| 12 | Double coil pipe heating buffer |
| 13 | VTN or VTS vacuum tube collectors |
| 14 | Solar expansion tank |
| 15 | Spill container |
| 16 | Thermostatic boiler protection mixer valve |
| 19 | Thermal safety valve protection to safety water chamber |
| 20 | Solid fuel boiler |
| 11, 21 | Safety vent valve |
| 3, 18 | Connection to domestic water supply |
| 4, 17 | Heating circulation pump |

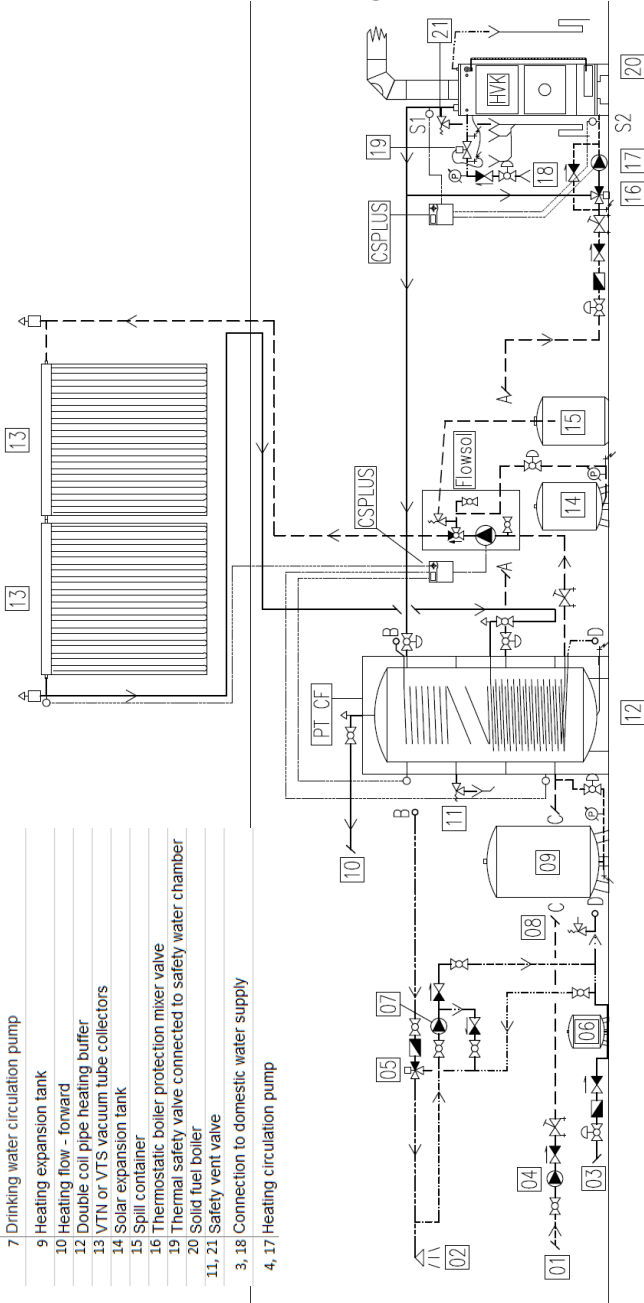


Figure 4

PUTTING INTO OPERATION

Deploying the unit and putting it into operation can only be performed by a professional technician. After mounting, the pipelines and the tank have to be flushed thoroughly, then the tank has to be filled up with water. Check the operation of the security valve and have the possibly accumulated air blown down. Before its first use, the buffer tank has to be fully filled up with water and cleaned from air. The maximum buffer temperature set on the boilers connected into one system together with the buffer tank should not exceed 95°C-ot. After the first heating, check the sealings.

TURN TO A PROFESSIONAL TECHNICIAN TO CHECK THE FIRST HEATING.

OPERATION AND MAINTENANCE

In order to ensure secure operation, it is rational to have a check of the appliances performed by a plumber every now and then (every year), with a special regards on the tightness of connections and on the correct operation of the safety valve.

Furthermore, it is rational to air the appliance out every year and to empty it in case of frost danger.

It is obligatory to build in a security valve and an expansion tank

A security valve with checked quality is permitted to be used. Every element of the system must bear the operating pressure. **It is strictly forbidden to mount a closing fitting between the security valve and the tank.**

The maximum opening pressure of the security valve should be not more than 7 bar (0,7MPa)!

IN CASE OF INDIRECT HEATING, PROTECTION AGAINST OVERHEATING SHOULD BE PERFORMED BY THE INDIRECT HEATING UNIT.

It is strictly forbidden to apply any sharp metal object or acid on the heat exchanger to remove deposited scale.

Water drainage

ATTENTION! HOT WATER MAY OUTFLOW DURING WATER DRAINAGE!

The drainage of the water tank is performed through the drainage tap mounted on the drainage pipe branch of the buffer tank (except for PT300, PT300C types).

In case of appliances of PT300, PT300C types, the function of the drainage pipe branch is taken by the lowest RP 1/2" pipe branch.

Commercial warranty for buffer tanks

Instead of the obligatory warranty period of 12 months as set in Government Decree of the Republic of Hungary No. 151/2003. (IX.22.), HAJDU Hajudúsági Ipari Zrt undertakes a warranty period of **36 months** on its product described on page 1 of this document.

Warranty rights can be exercised by the owner of the given appliance, if he/she/it is considered to be a consumer. (Pursuant to section 685 of the Civil Code in Hungary, the consumer is the person who enters into contract outside the scope of his/her/its economic or professional activities.)

Warranty does not affect the right of the consumer granted by law.

According to his/her/its preference, the consumer has the right for demanding reparation or exchange, except for the case when it is impossible to fulfill the selected warranty demand or when it would lead to disproportionate extra cost for the obliged party as compared to other warranty demand (section 306 of the Civil Code).

The main element of our appliances is: welded tank

IMPORTANT INFORMATION

1. The consumer can exercise his/her/its warranty demand with the help of the commercial warranty.
2. Please, require the seller to mark the sales date on every coupon of the commercial warranty.
3. Warranty reparation work can exclusively be performed by the repair service listed in the service list in case of a valid commercial warranty.
4. Any commercial warranty issued in a non-compliant way or lack of giving the commercial warranty to the consumer does not affect the validity of liability for warranty. In this case, please turn to our Customer Service.
5. Any lost commercial warranty will be replaced only on the basis of certified justification of the fact of the sales (invoice).
6. The **warranty period** starts by the day of handing the product over to the consumer.
7. In case of reparation of the product, the warranty period is lengthened with the time starting from the report of the defect during which the consumer has been blocked to use the product according to its purpose, due to the defect.
8. The reparation has to be performed in a way that as a result of reparation, the value and usability of the product are not reduced as compared to a defect-free product used according to its purpose during the same time. In case of reparation a new part is built in the product.
9. If the party obliged to provide warranty does not undertake reparation by an adequate deadline or misses to perform the reparation, the consumer has the right to have the defect repaired at the cost of the party

obliged to provide warranty.

Consumer rights based on warranty and guarantee are the following:

Pursuant to sections 306-307 of Act 4 of 1959 on the Civil Code, to section 4 of GKM Decree (Ministry of Economy and Transport) No. 49/2003. and the dispositions of Government Decree No. 151/2003. (IX.22.), the distributor has to strive to perform product repair or exchange within maximum 15 days.

When can the consumer ask for the exchange of the product?

If the product breaks down within 3 days after buying, the selling commercial unit can exchange the product into a new one of the same type, as requested by the consumer. If there is no possibility for product exchange, according to the preference of the consumer

- the sales price is paid back in the same time as the product is returned
- or a product of a different type is handed over to the consumer as the price difference between the two products is settled. In case of exchange within 3 days, the appliance has to be returned to the sales unit intact, in its original packaging, including all the parts of the appliance and the packaging.

The location of product repair.

- Products with fixed mounting and the ones that are heavier than 10 kg are repaired on the location of the operation.
- If the repair can not be performed on the location of the operation, it is the task of the repair service to perform mounting down and up the appliance and transporting it from and to the location of the operation.
- Our repair service agrees with the consumer in advance on the field work and performs the field work either in the morning or in the afternoon of the day agreed.

At whom and when should the consumer report its demand based on warranty?

The consumer should report his/her/its demand based on warranty to the service or the contracted distributor as listed on the attachment of the commercial warranty. The consumer is obliged to report his/her/its plea without any delay. It is the consumer who is liable for any damage occurring due to delayed reporting.

Procedure to be followed in case of dispute on the feature of the defect.

- If the repair service does not acknowledge the rightness of the plea, it can turn to the Hungarian Authority for Consumer Protection (in Hungarian: Fogyasztóvédelmi Főfelügyelőség) for professional opinion. If the repair service does not fulfill its obligations described above demonstrably, the consumer has the right to turn

to this quality examination organ in person.

- The examination and the professional opinion performed by the quality examination organ are subjects to fees.
- The assignment aiming to obtain the professional opinion has to contain the standpoints and statements of both the repair service and the consumer.

The repair service or the distributor is obliged to make a record on the plea of the consumer with the following content and to hand over a copy of this record to the consumer:

- the name and the address of the consumer,
- the name and the price of the product,
- the date of buying the product,
- the date of reporting the defect,
- the demand the consumer wishes to enforce,

The professional opinion of the Hungarian Authority for Consumer Protection is not obligatory for the distributor.

If the distributor does not accept the professional opinion, then the consumer may turn to the Conciliation Board (in Hungarian: Békéltető Testület) in order to reach an agreement out of court, which acts for an acting fee of 1000 HUF, makes a decision between max. 60 days and discloses both the plea and the recommendation, or the consumer may turn to the Court.

The warranty undertaken for our appliances terminates, if any of the following occurs:

- the appliance has been put into operation differently than the dispositions of the usage instructions or in an unprofessional way,
- the parts used for the reparation of the appliance are not among the ones that our Company has qualified and distributed for this purpose
- if our Company or the repair service assigned to perform reparation work proves that the defect has been caused by water pollution, water pressure insufficiency, service disturbances, use not according to purpose, transformation, unprofessional handling, missing maintenance, incorrect storage, natural disaster or any other reason emerged after buying.
- In order to avoid use not according to purpose, usage (handling) instructions are attached to the product and the buyer is kindly asked to comply with these dispositions in his/her/its own interest as our Company undertakes no warranty due to defect caused by usage or handling of the product differently than the usage instructions. The performance of maintenance work is also part of the consumer's tasks. The reparation costs of any product broken down due to miss-

ing maintenance within the warranty period also charge the consumer.

Tasks of the distributor and repair service related to the commercial warranty.

The distributor is obliged to check the number of the commercial warranty and the number of the product at the sales of the product, to certify the commercial warranty through writing the date of buying onto it and to hand it over to the consumer. ***The distributor has to fill all the commercial warranties.*** The repair service is obliged to fill up the sections of the commercial warranties precisely, without any missing information.

(See commercial warranty and warranty coupons on page 64)

**HAJDU Hajdúsági Ipari Zrt
Customer Service**