

# Liquid cooled drives for rough fields of application

The ATV 61Q & ATV 71Q frequency inverters are used when drives with particular robustness are required. The integrated liquid cooling permits optimal dissipation of the lost heat from the power part and therefore optimizes the encapsulation of the whole electrical drive unit.



## Special features

The lost heat from the power electronics of the ATV 61Q & ATV 71Q frequency inverters are dissipated via a coolant. By means of the innovative cooling system the proven water-glycol-mixture can be used as coolant as well as clean water or industrial water.

The connection for the cooling circuit is well arranged at the top of the inverter close to the back wall, near the separated air flow.

### Highest robustness during operation

- Excellent protection against corrosion due to cooling pipes made of stainless steel
- Marginal deposits due to smooth flow channel
- Reliable operation also when industrial water or fresh water is used for cooling
- Use in an open or closed cooling circuit possible
- Wide temperature range of the coolant up to +55°C

### Reliable and simple installation

- Clear separation of electrical and hydraulic connections
- Internal separation wall between electronics and cooling water
- Complete de-aerating due to the connections arranged at the top

### Consistency to the Altivar products

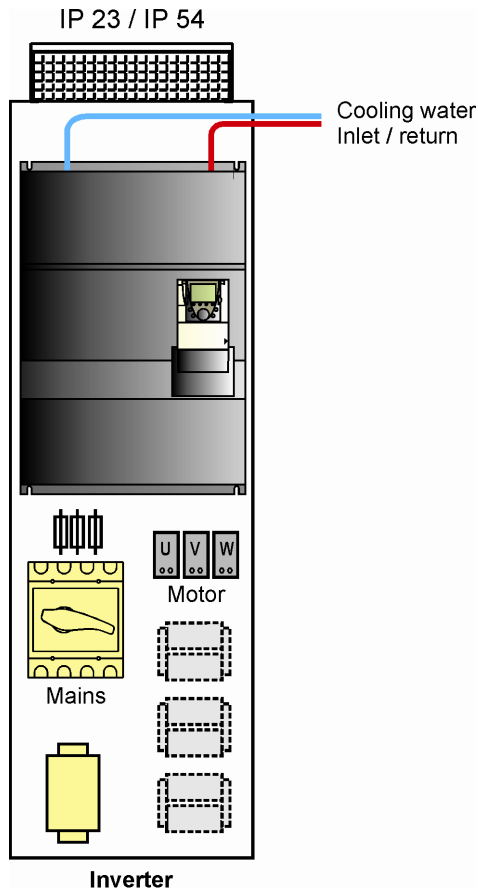
- Control, operation and programming is absolutely identical to the air-cooled devices
- Options of the ATV 61 & ATV 71 product lines can be used



### Typical applications

Industry  
Plastics machines  
Mining, tunneling  
Shredders  
Ships

## Use of the ATV 61Q & ATV 71Q inverters in plastics machines



Liquid cooling of electrical and mechanical units is already best-proven in the area of plastics machines. Due to their robust cooling system, the ATV 61Q & ATV 71Q frequency inverters can be particularly integrated into existing cooling concepts.

The distinctive advantage of the ATV 61Q & ATV 71Q frequency inverters is their flexibility for different cooling concepts:

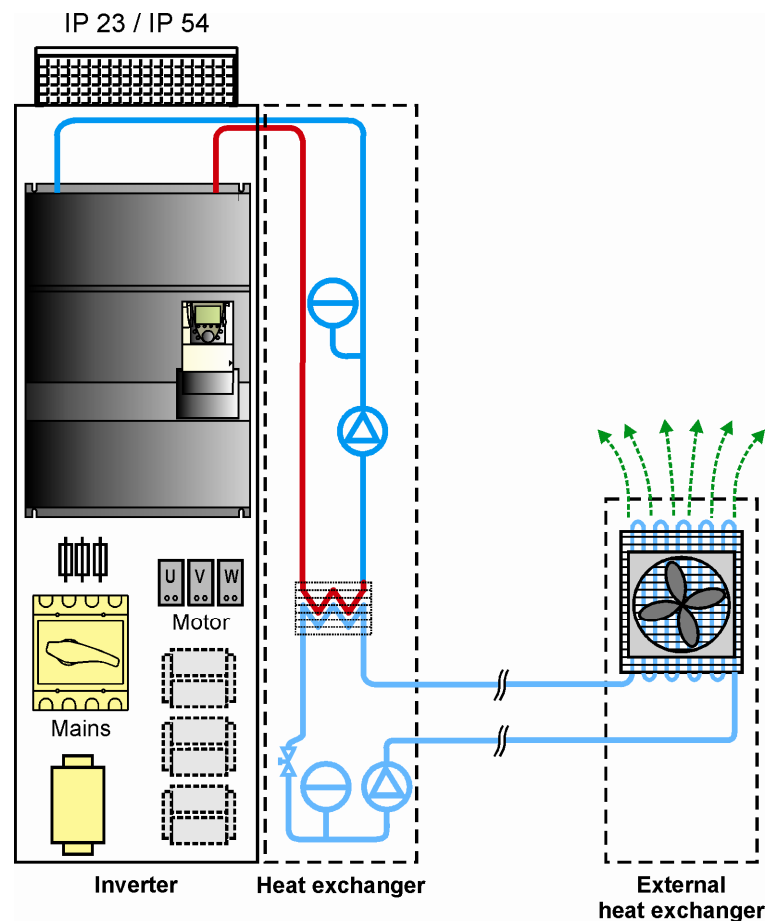
- Open or closed cooling circuit with industrial water
- Open or closed cooling circuit with a high inlet temperature of up to +55°C
- Open cooling system with flowing water cooling

## Use of the ATV 61Q & ATV 71Q inverters in industry

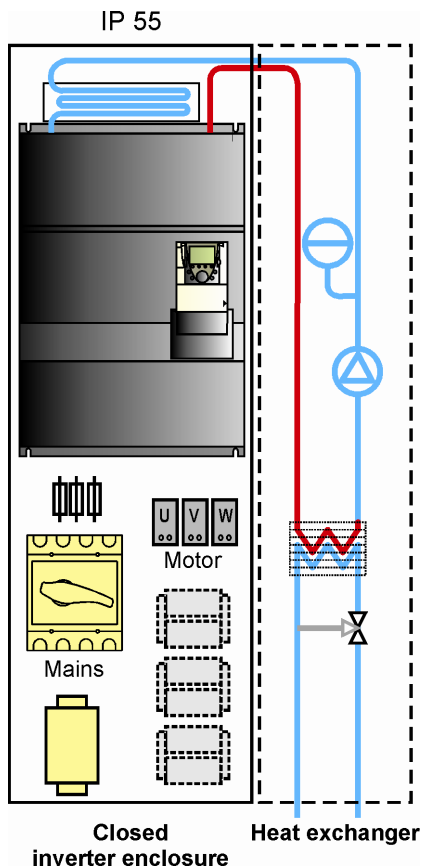
The lost heat of several inverters with high power in an electrical room can easily lead to overheating of the operating room. On the other hand, when the main losses of the inverters are dissipated to a liquid coolant, the installation of an expensive air conditioning can be avoided. With their internal liquid cooling the ATV 61Q & ATV 71Q frequency inverter are optimally prepared for these applications. In this concept about 85 % of the inverter losses are dissipated from the electrical room by means of the cooling water.

The distinctive feature of the ATV 61Q & ATV 71Q frequency inverters is their flexibility for different cooling concepts:

- With a common cooling circuit it is possible to conduct the losses from the electrical room or container to the heat exchanger.
- In case of a 2-step cooling circuit the air/water heat exchanger can be installed far away from the inverter and with high difference in altitude.



## Use of the ATV 61Q & ATV 71Q inverters in mining and tunneling



Enclosures in protection degree IP55 or higher, closed containers or also pressure-resistant encapsulation require a complete heat abstraction of the whole electrical drive unit. Therefore 100 % of the losses must be dissipated by the cooling water. This can be done easily with an additional air/water heat exchanger. Thereby the monitored fans in the inverter provide the required air circulation inside the enclosure.

The significant advantages of the ATV 61Q & ATV 71Q frequency inverters for this application are:

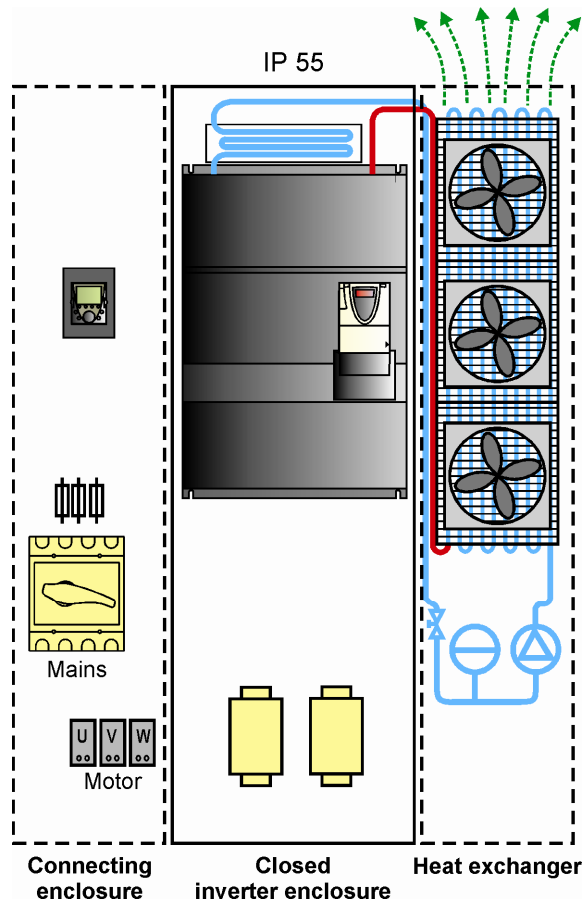
- Fans for internal air circulation are already built-in.
- Full overload is available even in the smallest speed range.
- "Low noise" requirements are optimally fulfilled due to the completely closed inverter unit.

## Use of the ATV 61Q & ATV 71Q inverters in shredders

A dust loading even with conductive particles cannot be prevented around shredder drives, especially in case of recycling processes. As a result, special requirements regarding the protection degree are needed for the electrical installation. In a perfectly adapted drive system, sealing walls between the accessible connecting area, the inverter enclosure and the cooling enclosure prevent intrusion of dangerous particles.

The advantages of the ATV 61Q & ATV 71Q frequency inverters for this application are:

- The inverter enclosure is securely closed and must not be opened for connection or start-up.
- The very high starting torque is available unchanged also in case of frequent starting.
- The monitored fans in the inverter as well as the air/water heat exchanger reliably provide the required cooling inside the inverter enclosure



## Robust design - simple installation

The today's requirements of our customers as well as our knowledge from more than 20 years experience in manufacturing of liquid cooled power electronics were the specifications for developing the especially robust ATVQ inverters.

### Heat sink:

- Cooling circuit completely made of stainless steel
- Continuously big flow channel
- Smooth internal walls
- Additional fans for reliable internal air circulation



### Cooling circuit:

- Hydraulic and electrical connections are clearly separated
- High permitted temperature range of the cooling water
- Riskless de-aerating
- High-quality, double-sealed connections

General technical data	
Voltage / frequency	380 V / 400 V / 440 V / 480 V ±10 %: 50/60 Hz ±5 % 500 V / 600 V / 690 V ±10 %: 50/60 Hz ±5 %
Power range	90...800 kW
Overload	as ATV 61 & ATV 71
Operating temperature water	+5...+55 °C
Ambient temperature air	ATV 71Q: -10...+50 °C ATV 61Q: -10...+45 °C
Filling quantity / flow rate:	ATV71QD90N4...C13N4, ATV71QC11Y...C16Y, ATV61QC11N4...C16N4, ATV61QC13Y...C20Y: 0.2 l / 8 l/min ATV71QC16N4...C25N4, ATV71QC20Y...C31Y, ATV61QC20N4...C31N4, ATV61QC25Y...C40Y: 0.4 l / 24 l/min ATV71QC31N4...C50N4, ATV71QC40Y...C63Y, ATV61QC40N4...C63N4, ATV61QC50Y...C80Y: 0.7 l / 24 l/min
Standards	Devices are designed, built and tested on the basis of EN 618 00-5-1
Approvals	CE (UL and CSA in preparation)

380...480 V			500... 690 V				Dimensions [mm]	
ATV 61Q & ATV 71Q	Power 400 V [kW]	Current 400 V [A]	ATV 61Q & ATV 71Q	Power 690 V [kW]	Power 500 V [kW]	Current 690 V [A]		Current 500 V [A][A]
ATV71QD90N4	90	179	ATV71QC11Y	110	90	125	136	950 / 330 / 377
ATV71QC11N4	110	215	ATV71QC13Y	132	110	150	165	950 / 330 / 377
ATV71QC13N4	132	259	ATV71QC16Y	160	132	180	200	950 / 330 / 377
ATV71QC16N4	160	314	ATV71QC20Y	200	160	220	240	950 / 585 / 377
ATV71QC20N4	200	387	ATV71QC25Y	250	200	290	312	950 / 585 / 377
ATV71QC25N4	250	481	ATV71QC31Y	315	250	355	390	950 / 585 / 377
ATV71QC31N4	315	616	ATV71QC40Y	400	315	420	462	1150 / 1110 / 377
ATV71QC40N4	400	759	ATV71QC50Y	500	400	543	590	1150 / 1110 / 377
ATV71QC50N4	500	941	ATV71QC63Y	630	500	675	740	1150 / 1110 / 377
ATV61QC11N4	110	215	ATV61QC13Y	132	110	150	165	950 / 330 / 377
ATV61QC13N4	132	259	ATV61QC16Y	160	132	180	200	950 / 330 / 377
ATV61QC16N4	160	314	ATV61QC20Y	200	160	220	240	950 / 330 / 377
ATV61QC20N4	200	387	ATV61QC25Y	250	200	290	312	950 / 585 / 377
ATV61QC25N4	250	481	ATV61QC31Y	315	250	355	390	950 / 585 / 377
ATV61QC31N4	315	616	ATV61QC40Y	400	315	420	462	950 / 585 / 377
ATV61QC40N4	400	759	ATV61QC50Y	500	400	543	590	1150 / 1110 / 377
ATV61QC50N4	500	941	ATV61QC63Y	630	500	675	740	1150 / 1110 / 377
ATV61QC63N4	630	1188	ATV61QC80Y	800	630	840	900	1150 / 1110 / 377



**AUTOMATION CONTROL**  
ROBOTICS > DRIVES > SYSTEMS