



**Alfons Haar**

# Helicopter Refuelling System

**for civil and  
military vessels**  
with PreciFUEL technology



## HRS Pump Filter Module PFM



### The Pump Filter Module (PFM)

is the core of the AH Helicopter Refuelling System HRS.

It provides all pumping and filtration functions for fuelling, defuelling, refreshing, flushing, intertank transfer, loading/ bunkering etc. – each monitored and controlled by the integrated ARU-Master controller.

It includes a continuous flow rate based differential pressure monitoring for the filter water separator and other safety features to safeguard the fuelling process without the need for operator interaction.

The PreciCONTROL technology eliminates the need for an external control cabinet even for the explosion proof setup. The result is an exceptionally compact design.

#### OPTIONS

- Choice of operation modes (dedicated or set of modes)
- Choice of supply voltage and frequency
- Up to two pumps per module
- Explosion proof setup
- PD meter
- Filter monitor
- Shock-proof classification



No separate Control Cabinets required

**80%**  
Less wiring

## Advantages

- ✓ **Short delivery times** (modular COTS design)
- ✓ **All technical data available** (3D STEP files, IPC Manuals ...)
- ✓ **CE, IEC/ATEX, JIG, PYC, CAP 437, NATO**
- ✓ **GL, Lloyd's Register class approved**
- ✓ **Large vertical integration** warrants long term spare part supply
- ✓ **Digital communication with IMCS**
- ✓ **Global service**
- ✓ **Future-proof** in full compliance with international standards and unrestricted upgrading

## Savings

- 80%** Less wiring
- 35%** Less space
- 20%** Less weight
- ✓ **Compact & Clever Design**
- ✓ **Easy & Simple** Installation with Masterbus

#### STANDARDS

Alfons Haar, ISO 9001 certified, manufactures the essential components and produces HRS as a factory assembled and tested into-plane refuelling system.

The system is designed according to CE directive, IEC/ATEX as well as JIG and PYC regulations and classification CAP 437 society rules by GL and LRS.

All modules are available in various options and can be individually combined with each other to customise a complete system.

Each module has its individual ARU-Master microprocessor controller with operator displays, making it independent from the others. Simultaneously, the master bus connects all modules with each other perfectly. The structure allows full scalability and features from remote control up to full redundancy.

## HRS Refuelling Module RM



### The Refuelling Module (RM)

is the front end of the AH Helicopter Refuelling System HRS.

The integrated ARU-Master controller guides the operator and displays all necessary information such as meter volume, flow rate, filter condition, tank inventory, pump status and more.

Its menu-based navigation, including help text messages and powerful integral diagnostics enable easy and safe operations.

The Refuelling Module is designed for the harshest environments, all electronic equipment is potted and explosion proof.

#### OPTIONS

- Choice of hoses and nozzles
- Choice of hose reel size
- Choice of operation modes
- PD meter
- Inline pressure control
- Deadman remote control
- Fast nozzle replacement
- HIFR support
- Large scale LED overhead volume display
- Shock-proof classification

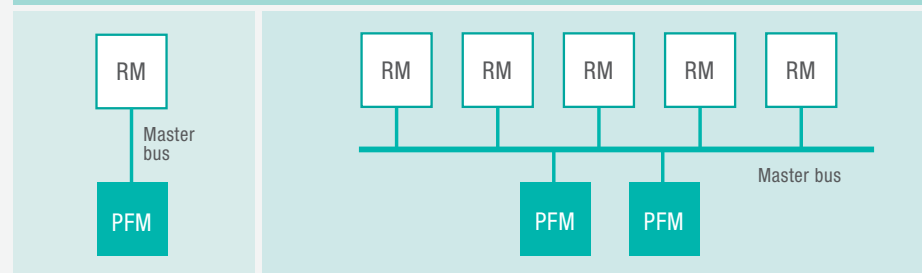


**80%**  
Less wiring

#### AVAILABLE VARIANTS OF THE MODULAR SYSTEM

CONFIGURATIONS	CLASS S (SMALL)	CLASS M (MEDIUM)	CLASS M2 (MEDIUM EXTENDED)	CLASS L (LARGE)
AVAILABLE NOMINAL FLOW RATES	100 l/min 130 l/min 165 l/min 205 l/min	250 l/min 315 l/min	405 l/min 500 l/min 620 l/min	740 l/min 940 l/min

#### COMBINATION EXAMPLES: STANDARD OR PEER TO PEER NETWORK



#### 3 CLASSES TO FIT ALL SIZES

CONFIGURATIONS	CLASS HM (HORIZONTAL MINI) Extra small module for easy applications	CLASS H (HORIZONTAL) Compact unit for hose reels up to 1000 mm	CLASS V (VERTICAL) Slim unit for large hose reels above 1000 mm
FUNCTIONS	- Overwing fuelling - Overwing defuelling - Flushing	- Overwing fuelling - Overwing defuelling - Underwing fuelling - Underwing defuelling - Flushing	- Overwing fuelling - Overwing defuelling - Underwing fuelling - Underwing defuelling - Flushing

# Helicopter Inflight Refuelling System

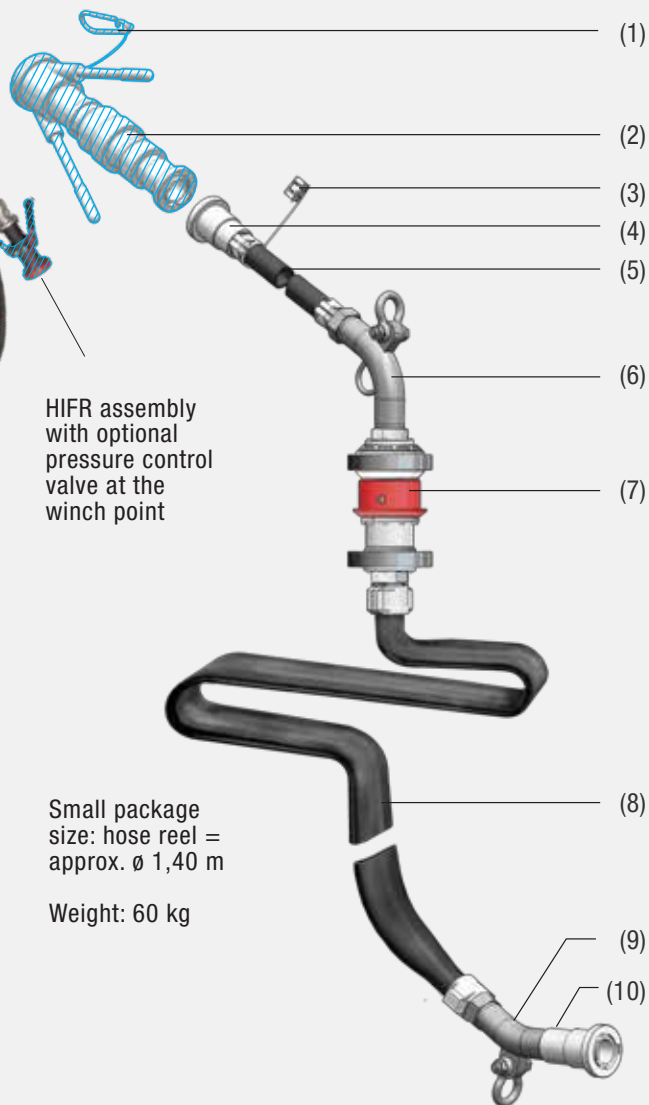
## DESCRIPTION

- UNISEX couplings acc. to MIL-C-53071
- High flow rate due to low pressure drop
- Real dry break function
- Cost saving by using the aircraft coupling of the HRS (integrated aircraft coupler is optionally available)
- Highly resistant against sea air caused corrosion
- Temperature range: -32°C to +50°C
- Manufactured under the quality monitoring of Alfons Haar (DIN ISO 9001)
- The individual safety components and the assembly are supplied with certificates according to DIN EN 10204
- Conform with Certificate of Airworthiness requirements
- Electrical conductivity achieved without additional cables
- Break force - pressure independent

STANAG  
3847  
conform and  
German  
Navy  
approved



## HIFR ASSEMBLY:



HIFR assembly  
with optional  
pressure control  
valve at the  
winch point

Small package  
size: hose reel =  
approx.  $\varnothing$  1,40 m

Weight: 60 kg

## HIFR ASSEMBLY COMPONENTS (downstream) Part no. 2313695

- (1) Hook to fasten the aircraft coupling at the winch point
- (2) Existing aircraft coupling of the HRS (alternative CCR)
- (3) Bonding assembly according to STANAG 3682
- (4) UNISEX couplings to fit the HIFR assembly to the refuelling hose
- (5) 3m (10 ft) electrically conductive hose DN38
- (6) Winch point with lifting eye
- (7) Break away coupling with a breaking point acc. to STANAG 3847
- (8) 30m (100 ft) electrically conductive flat hose
- (9) Deck tie down point with shackle (hook optional)
- (10) UNISEX coupling for full pump performance with a high flow rate

## OPTIONAL

- HIFR assembly with fixed aircraft coupling and a pressure control valve at the winch point for easier handling (part no. 2299338)
- Test kit for break force (part no. 2303671)
- CCR nozzle (45 psi) with UNISEX coupling (art no. 2491664)