Date: 19.04.2018.

PROCUREMENT DOCUMENTATION No. 2

Tender for delivery of offers for service of front and rear inverter, front motor and front gearbox development

Procurement No. 5/18

1. CUSTOMER DETAILS

Company:	Rimac Automobili d.o.o.
Address:	Ljubljanska 7, 10 431 Sveta Nedelja, Croatia
Personal identification No.:	HR53943536946
Internet address:	http://www.rimac-automobili.com
E-mail:	hrvoje@rimac-automobili.com
Phone:	+385 1 563 45 92
Fax:	+385 1 333 66 98

2. DETAILS ON CONTACT PERSON FOR COMMUNICATION WITH SUPPLIERS

Communication and any other information exchange between Customer and Bidder will be done only via e-mail. All questions and requests for explanations can be sent via e-mail at: **hrvoje@rimac-automobili.com**

Customer is obliged to respond on request for additional information and give further explanations only when they have been sent via e-mail to address specified above. For the purpose of equal treatment of all Bidders answers on requests will be sent to all Bidders, regardless which Bidder have sent starting request or question.

3. BEGINNING OF THE PUBLIC PROCUREMENT PROCESS

Starting date of the public procurement process is date when The Notification on Procurement is published on internet page www.strukturnifondovi.hr.

4. PROCUREMENT TYPE

Open public procurement process with the public Notification on Procurement is being applied.

5. DESCRIPTION OF THE PROCUREMENT SUBJECT

Customer is procuring **services of front and rear inverter, front motor and front gearbox development.** All Bidders must respect technical specifications provided in Point 7 of the Procurement documentation. Procurement is not separated in groups.

Tender for delivery of project offers is being published in English and, accordingly, technical specifications are also in written English, for the purpose of equal treatment of all potential Bidders and unequivocal understanding of all parts of the technical specifications, with regard that English language represents common language in the technical specification for the subject of this purchase.

6. MANDATORY REASONS FOR EXCLUSION - CONDITIONS WHICH MUST BE FULFILLED BY ALL POTENTIAL BIDDERS

Customer is obliged to exclude Bidder from the procedure in the case:

a) if Bidder or person authorised for its legal representation is sentenced for a criminal offense of participation in criminal organisation, corruption, frauds, terrorism, financing of terrorism, money laundry, child work abuse or other forms of trafficking;

b) if Bidder hasn't fulfilled its payment obligations towards Tax Office, Pension and Health Insurance Fund, except in the case when, according to the special legislation, payment of these commitments is not allowed or postponing of payment is approved;

c) if Bidder has mispresented or gave false information related to the conditions set by Customer as a reasons for exclusion or qualification conditions;

d) if Bidder is in the bankruptcy procedure, has solvency issues or it is in the liquidation process, if bankruptcy manager or court is managing Bidder's assets, if Bidder is in the settlement process with its creditors, if the Bidder has terminated its business activities or it

is in any other similar situation which arises from the similar procedure in line with the national legislation and regulations;

e) if Bidder has done, in last three years since the beginning of this procurement process, heavy professional misconduct i.e. is guilty for unprofessional representation, and Customer can prove that in any manner available;

f) if the conflict of interest cannot be eliminated by removal of the Procurement process board member from the board in the case when conflict of interest exists.

Absence of reasons for exclusion provided in Point 6. of the Procurement documentation Bidder will prove by signed statement provided along with the offer. Proposal of that statement is provided as an **Annex of the Procurement documentation.**

This Statement does not have to be verified by the notary.

7. TECHNICAL SPECIFICATIONS

7.1 Rear inverter (2 sets)

ELECTRICAL SPECIFICATION – Applies over rated range of temperatures unless otherwise stated.	
HIGH VOLTAGE (DC) WORKING RANGE	50 – 820 V
HIGH VOLTAGE (DC), NON-OPERATING	870 V
DC BUS SELF-DISCHARGE	600 s max discharge to 50V after removal of supply
DC BUS CAPACITANCE	2mF based on switching frequency, load inductance, and voltage ripple requirements
DC BUS STRAY INDUCTANCE	20 nH max. measured from any parallel-connected equivalent phase half-bridge.
CAPACITOR RIPPLE CURRENT	400 Arms
DC CURRENT	+/– 550 A rated continuous
AC CURRENT	1000 Arms for 10 s 700 Arms for 30 s 460 Arms rated continuous
AC FUNDAMENTAL FREQUENCY	0 – 1000 Hz
SWITCHING FREQUENCY	0 – 20 kHz; 0kHz requires 100% on time for any given switch
PEAK EFFICIENCY	97% min – conditions TBD
VOLTAGE MEASUREMENT V_{phase} (3x) & Vdc	$V_{measure}$ tolerance = +/– 0.5% BW = 100kHz min; 125kHz max 900V max
CURRENT MEASUREMENT I_{phase} (3x) & Idc	$I_{measure}$ tolerance = +/– 2% BW = 100kHz min; 125kHz max
MODULE TEMPERATURE t_{SWITCH} (3x)	$t_{measure}$ tolerance = +/– 5% of full scale -40C – 125C BW = 10kHz min; 15kHz max
LOW VOLTAGE SUPPLY (VBB)	6 – 16 V subject to automotive standards, e.g., load dump and reverse battery (ISO 7637-2 or equivalent)

LOW VOLTAGE CURRENT	5 A max without control board
POWER UP TIME	t_{PU} = 200ms max. Chassis referenced voltage supplies to power up and accept gate commands within this time. Gates switched once (no PWM).
LOW VOLTAGE DROPOUT	$t_{DROPOUT}$ = 10 ms. All circuits to remain fully functional with removal of the low voltage supply.
UNDERVOLTAGE LEVEL	90% nominal
PROPAGATION DELAY TOLERANCE	t_{PROP_TOL} = 100 ns max $t_{PROP\_TOL} = t_{PROP}$(max switch) – t_{PROP}(min switch) Prop delays measured from time gate signal is active at control board connector until gate voltage exceeds max datasheet threshold voltage. Applies to both ON and OFF.
DESAT LOCKOUT TIME	$t_{LOCKOUT}$ = 3.5 us max Measured from time fault signal active to active signal at the connector. $t_{BLANKING}$ = 3us min t_{GLITCH_REJECT} = 1us max
ISOLATION	All circuits and components on the high voltage bus and AC phase terminals to be isolated in compliance with functional and reinforced requirements of IEC 60664-1.
CMTI	35kV/us min

COOLING AND MECHANICAL	
COOLING MEDIA	50/50 water/glycol mixture
COOLANT TEMPERATURE, RATED	–40 – 80°C
COOLANT TEMPERATURE, DE-RATED OUTPUT	80 – 100°C Output current derates linearly from 100% to 0%.
COOLANT FLOW RATE	36 lpm
COOLANT PRESSURE	TBD
PRESSURE DROP	1 bar (for shared coldplate in double housing)
AMBIENT AIR	–40 – 70°C
STORAGE TEMPERATURE	–40 – 85°C
ALTITUDE	3000 m

HOUSING	
DIMENSION	Max. 60 litres
PROTECTION	IP67
MASS	24 kg max, with coolant
MOUNTING	Housing to allow mounting on any axis, in any orientation.
CONNECTORS	Shielded 360 degrees. Rated IP67.
De=gas	
Vibration	ISO 16570-3 or equivalent

7.2 Front inverter (2 pcs)

Peak current (10 sec duration)	2x 550 A
Continuous current	2x 370 A
Peak power (10 sec duration)	2x 250 kW
Continuous power	2x 150 kW
Maximum efficiency	>97 %
Voltage working range	400 - 800 V
Coolant type	Water / glycol
Max. coolant temperature (outlet from inverter)	105 °C
Min. coolant inlet temperature before derating	70 °C
Maximum coolant flow rate (for double inverter)	40 L/min
Maximum pressure drop @ max coolant flow	0,4 bar
Maximum coolant pressure (minimum value)	2,5 bar absolute
Coolant inlet temperature sensor	If possible
Power stage temperature sensor	YES
Maximum weight with coolant (for double inverter)	17 kg
Maximum outer volume (or double inverter)	19 L
Combined housing (two inverters in one housing)	YES
Single HV DC supply connector (for both inverters)	YES
Interlock protection on HV DC connector	YES
AC connections (rigid) to the motor inside the housing	YES
Storage temperature range	-40 to 85 °C
Operating temperature range	-40 to 70 °C
Standards / homologation	ISO26262 or equivalent preferred

7.3 Motor (2pcs)

Peak torque (10 sec duration)	2x 450 Nm
Peak current	2x 550 A
Continuous torque	2x 280 Nm
Peak power (10 sec duration)	2x 220 kW
Continuous power	2x 150 kW
Maximum speed	10 000 rpm
Maximum efficiency	>95 %
Voltage working range	400-800 V

Preferred coolant	Water / glycol
Max. coolant temperature (outlet from motor)	105 °C
Min. coolant inlet temperature before derating	80 °C
Maximum coolant flow rate (for double motor)	60 L/min
Maximum pressure drop @ max coolant flow	0.7 bar
Maximum coolant pressure	2,5 bar absolute
Coolant inlet temperature sensor	If possible
Windings temperature sensor	YES
Maximum weight with coolant (for double motor)	80 kg
Maximum outer diameter	335 mm
Maximum outer volume (for double motor)	28 L
Combined housing (two motors in one housing)	YES
AC connections (rigid) to the inverter inside the housing	YES
Environmental protection	IP67
Storage temperature range	-40 to 85 °C
Operating temperature range	-40 to 70 °C

7.4 Gearbox (2pcs)

Peak input torque (for min. 10 sec)	500 Nm
Continuous input torque	280 Nm
Max input power (10 sec peak)	220 kW
Continuous input power	150 kW
Maximum input speed	10 000 rpm
Minimum efficiency	97%
Number of speeds	1
Reduction ratio	3,80
One gearbox per wheel	YES
Number of motor inputs	1
Motor axis orientation	parallel to halfshaft axis
Motor position referenced to wheel axle	in front
Integrated parking brake	NO
Oil temperature sensor	YES
Maximum gearbox temperature	110 °C - depending of recommended oil
Cooling	Air - please define needed air flow
External cooling circuit	NO
Lubrication (splash / pump)	Splash
Mechanical interface to motor	housing integrated with motor
Maximum weight (with oil)	10 kg
Storage temperature range	-40 to 85 °C

Operating temperature range	-40 to 70 °C
Lifetime	100.000 km

The Bidder must present its offer in following manner:

Order No.	Attribute	Value ordered by Customer	Offered specification
1			
2			
3			
4			
5			

8. EVALUATION CRITERIA

Criteria for a selection of Bidder is economically best offer (the best value for money). Details for evaluation and scoring of the proposal are listed in Tables 5 and 6.

Category	Criteria		Points	Share
Front inverter	Technical requirement	Satisfies criteria 20 points , Does not satisfy criteria 0 points	20	20%
Front motor	Technical requirement	Satisfies criteria 20 points , Does not satisfy criteria 0 points	20	20%
Front gearbox	Technical requirement	Satisfies criteria 20 points , Does not satisfy criteria 0 points	20	20%
Rear inverter	Technical requirement	Satisfies criteria 20 points , Does not satisfy criteria 0 points	20	20%
Delivery time	Less than 360 days	Satisfies criteria 10 points , Does not satisfy criteria 0 points	10	10%
Price	Lowest offer in comparison with all submitted offers	Evaluation formula: Lowest offer/Evaluated offer, Max 10 points	10	10%
Maximum number of points			**100**	**100%**

9. PLACE OF DELIVERY

Ljubljanska 7, 10431 Sveta Nedelja, Croatia

10. PREPARATION AND DELIVERY OF OFFERS

Offers must be delivered in English language and Latin alphabet. While drafting the offer, Bidder must follow requirements and conditions set in this Procurement Documentation.

The offer must contain at least:

1. Full name of the Bidder, its address and name of the contact person
2. Detailed description of the equipment, in line with the specifications provided in Point 7 of this document. All parts of technical specifications must be listed as it is prescribed in Point 7. of this document.
3. Financial offer in EUR
4. Signed and stamped Statement provided as an Annex to this Documentation
5. Date and signature of person authorised for representation of the Bidder.

Offer must be submitted in electronic form via e-mail address provided in Point 1 of this Document for delivery of offers.

11. APPLICATION DEADLINE

Application deadline is 30.04.2018., 23:59 h.

12. DELIVERY DEADLINE

Delivery deadline starts immediately after contract signing. Selected Bidder is obliged to deliver and install equipment latest 360 days after contract signing.

13. CHANGE OR WITHDRAWAL OF THE SUBMITED OFFERS

Bidder is allowed to change or withdraw its offer before application deadline.

If Bidder submits changes or supplements its offer, it must be submitted in the same manner as original bid, with indication that this new document represents change/supplement of the original offer.

14. VALIDITY OF OFFERS

The offer must be valid at least 120 days after application deadline.

15. SELECTION OF THE BEST OFFER

Deadline for evaluation and decision making on Supplier is 10 working days after application deadline. All Bidders will be informed on decision in that period.

ANNEX

BIDDER'S STATEMENT ON ABSENCE OF REASONS FOR EXCLUSION
Procurement of the service of front and rear inverter, front motor and front gearbox development, Procurement No. 5/18

In order to prove absence of situations described in Point 6 of the Procurement Documentation which could lead to the exclusion of the Bidder from the public procurement process, I am giving

STATEMENT

that I, _____, from _____,
(Name and Surname) (Place of residence)

Personal Identification No.:_____, ID No. _____ issued by

_____, under material and criminal responsibility, declare:

- that Bidder is not sentenced for a criminal offense of participation in criminal organisation, corruption, frauds, terrorism, financing of terrorism, money laundry, child work abuse or other forms of trafficking;
- that Bidder has fulfilled its payment obligations towards Tax Office, Pension and Health Insurance Fund, except in the case when, according to the special legislation, payment of these commitments is not allowed or postponing of payment is approved;
- that Bidder has not mispresented or gave false information related to the conditions set by Customer as a reasons for exclusion or qualification conditions;
- that Bidder is not in the bankruptcy or pre-bankruptcy procedure, does not have solvency issues or it is in the liquidation process, that bankruptcy manager or court is not managing Bidder's assets, that Bidder is not in the settlement process with its creditors, that the Bidder has not terminated its business activities and it is not in any other similar situation which arises from similar procedure in line with national legislation and regulations;
- that Bidder has not done, in last three years since the beginning of this procurement process, heavy professional misconduct i.e. is not guilty for unprofessional representation, which Customer could prove in any manner available;
- that Bidder is not, in any case, in conflict of interest with the Customer's company, or any person authorised for representation of the Customer's company.

Place and date of drafting the bid: _____

FOR THE BIDDER:

_____
(Bidder's Name, Surname and Signature)